An Assessment of Social and Health Equity in Atlanta Streets Alive Events

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Katie Perumbeti
School of City & Regional Planning
Georgia Institute of Technology

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Advisor: Nisha Botchwey, PhD
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Introduction

Open streets, also known as ciclovias, are events that temporarily close street(s) to vehicular traffic and open them for people to run, walk, bike, skate, dance, play, and do other recreational activities. Within the United States, open streets events are held for a variety of reasons from encouraging physical activity to promoting economic development. The organizing entity in each city decides the route of an event based on its own criteria, and each event has to comply with different administrative processes and policies specific to the city in which it is held. Studies of past open streets initiatives have demonstrated the potential positive impacts of the events, including increased social capital, improved health, and boosts to the local economy. But which communities are realizing the impacts of these investments? Prior research indicates that minority groups in the U.S. and people of lower socioeconomic status (SES) tend to have higher rates of obesity, type 2 diabetes, physical inactivity, and other health indicators that lead to negative outcomes than their counterparts and, conversely, that living an active lifestyle has the potential to improve health. Thus, it is crucial to ensure that efforts to promote physical activity as a form of transportation and recreation are effectively directed at minority and low-SES populations.

This paper aims to summarize the benefits of open streets initiatives in the U.S. and uses Atlanta as a case study to evaluate open streets routes and the communities with access to the events. The research examines open streets events implemented within the City of Atlanta in relation to the demographic and socioeconomic characteristics of the communities with access to the event and the city as a whole. The research also considers potential routes that may better connect more subpopulations to an event. Ultimately, the research summarizes the reach of open streets events within Atlanta and provides recommendations for event organizers to consider in order to ensure that future events are accessible to as many Atlanta residents as possible and include populations that have historically been underserved to enable equitable exposure to the positive benefits of the events.

Open Streets Literature Review

Ciclovias are events that temporarily close street(s) to vehicular traffic and open them for people to run, walk, bike, skate, dance, play, and do other recreational activities. Ciclovias started in Bogota, Columbia in 1974, and are commonly referred to as open streets in the United States (Sarmiento et al. 2010). This literature review provides the foundation for the potential of open streets initiatives to positively impact health, economics, and/or social factors in an area and summarizes open streets research completed to-date. In addition, it begins by reviewing obesity and physical activity concerns in the United States that may be addressed by interventions that promote healthy behaviors, specifically physical activity.

Health Concerns and Disparities in the United States

Obesity

Over one third of adults and almost 17% of youth are obese in the United States based on 2011-2012 data (Ogden et al. 2013, Ogden et al. 2012, Hipp, Eyler, and Kuhlberg 2012). There is not a significant difference in the obesity prevalence between genders, but disparities in obesity prevalence exist between different race and ethnic groups, with the highest prevalence among non-Hispanic black and Hispanic adults (Ogden et al. 2013). There are also differences in obesity prevalence based on age group. Older women have higher rates of obesity compared to younger women, but there is not a significant difference between men of different ages (Ogden et al. 2012). For children and teenagers (i.e., under the age of 20 years), obesity prevalence is higher among adolescents (ages 6-19 years) than for preschool aged children (Ogden et al. 2012).

There was an increase in obesity prevalence among both men and women over the decade from 2000 to 2010; however, the increase for men was greater, climbing from 27.5% to 35.5%, whereas obesity prevalence among women only increased from 33.4% to 35.8% from 1999-2000 data to 2009-2010 data (Ogden et al. 2012). Accordingly, the difference between the obesity prevalence of men and of women diminished over the past decade of data. Similarly, boys experienced a statistically significant increase in obesity prevalence of the same time period from 14.0% to 18.6%, but there was not a significant change in the obesity prevalence of girls (13.8% to 15.05%) (Ogden et al. 2012). In addition, boys aged 6-11 years have the highest rates of obesity prevalence followed by boys aged 12-19 years, but for girls, the highest rates of obesity prevalence are for ages 12-19 years followed by ages 6-11 years (Ogden et al. 2012).

Data shows that obesity rates are higher among minority and low-income groups in the U.S., particularly among children (Hipp, Eyler, and Kuhlberg 2012, Levine 2011). Based on 2011-2012 data for adults in the U.S., obesity prevalence is highest among non-Hispanic black individuals (47.8%) followed by Hispanic (42.5%), non-Hispanic white (32.6%), and non-Hispanic Asian (10.8%) individuals (Ogden et al. 2013). Among women, obesity prevalence is the highest for non-Hispanic black females (56.6%) followed by Hispanic females (44.4%), but among men, obesity prevalence is highest among Hispanic males

(40.1%) compared to non-Hispanic black males (37.1%) (Ogden et al. 2013). The only statistically significant difference between genders by race and ethnicity in 2011-2012 was for non-Hispanic black individuals. Among men, obesity prevalence is highest for men living in households with income at or above 350% of the poverty level and second highest for men who live below 130% of the poverty level (33% and 29.2%, respectively) (Ogden et al. 2010). Conversely for women, obesity prevalence has an inverse relationship with income, with 42% of women living below 130% of the poverty line obese compared to 29% of women living at or above 350% of the poverty level (Ogden et al. 2010). These health disparities seem to be self-perpetuating in that lower SES and/or disadvantaged communities are continuously in a state of the same or poorer health over time. For example, a recent article by Rachel Kauffman summarizes a recent Harvard School of Public Health study, with the conclusion that "low-income people are less likely to eat healthy, and a poor diet might actually make income inequality worse" (Kauffman 2014).

Physical Activity

Based on the results of the 2000, 2005, and 2010 National Health Interview Surveys, higher percentages of adults in the U.S. are being advised by their doctors to get more physical activity over time (Barnes and Schoenborn 2012). In other words, adults in the U.S. are increasingly failing to meet physical activity recommendations. In 2010, 32.4% of adults were explicitly advised to exercise more by their doctor compared to an average of 22.6% in 2000 and 29.4% in 2005 (Barnes and Schoenborn 2012). In addition, adult groups in the age range of 45-74 years receive the highest percentage of recommendations to exercise more (Barnes and Schoenborn 2012). In 2000, 2005, and 2010, obese adults were advised to exercise approximately two times more than healthy weight adults; at the same time, the percentage of healthy weight adults advised to exercise increased by 39% from 2000 to 2010, which may indicate an increased emphasis on physical activity in general (Barnes and Schoenborn 2012, 4).

Similar to obesity prevalence, physical activity recommendations vary between race and ethnicity groups. In 2010, the percentage of Hispanic adults that received a recommendation to exercise was 35.8% compared 34.0% of non-Hispanic black adults, 32.7% of non-Hispanic Asian adults, and 31.5% of non-Hispanic white adults (Barnes and Schoenborn 2012). In addition, between 2000 and 2010, Hispanic adults experienced a larger percentage point increase in recommendations to exercise compared to the other ethnicities.

Healthy People 2020, the most recent version of the nationwide science-based, 10-year national objectives to improve the health of Americans, includes goals with objectives targeted at increasing the proportions of adults and adolescents meeting the current federal Physical Activity Guidelines (PAG) as well as increasing the number of trips under one mile made by walking and the number of trips under five miles made by biking (Office of Disease Prevention and Health Promotion 2015b). The federal PAG advise the minimum physical activity levels as shown in Figure 1; in addition, they recommend spreading activity throughout the week and being physically active at least three days per week (Office of Disease Prevention and Health Promotion 2015a).

Figure 1. Federal Physical Activity Guidelines for Adults

Aerobic Activities	If you choose activities at a **moderate** level, do at least **2 hours and 30 minutes** a week. If you choose **vigorous** activities, do at least **1 hour and 15 minutes** a week.	• Slowly build up the amount of time you do physical activities. The more time you spend, the more health benefits you gain. Aim for twice the amount of activity in the box at left. • Do at least 10 minutes at a time. • You can combine moderate and vigorous activities.
Muscle Strengthening Activities	Do these at least **2 days** a week.	• Include all the major muscle groups such as legs, hips, back, chest, stomach, shoulders, and arms. • Exercises for each muscle group should be repeated 8 to 12 times per session.

Furthermore, Healthy People 2020 includes Physical Activity goal PA-15 to "increase legislative policies for the built environment that enhance access to and availability of physical activity opportunities" (Office of Disease Prevention and Health Promotion 2015b).

Many organizations – both within and outside of government entities – recognize the value of a healthier population. Various nonprofit organizations together, for-profit companies, such as health insurance providers, and government agencies are all encouraging Americans to be more physically active through targeted campaigns and interventions. The U.S. Department of Health and Human Services (HHS) and President's Council on Fitness oversee a Let's Move! Campaign to encourage people to be physically active at various levels (President's Council on Fitness 2015). The non-profit organization America Walks acts an advocate and resource for walking and walkable communities at every level from local to statewide efforts (America Walks 2015).

The U.S. federal Physical Activity Guidelines recommend at least 60 minutes of moderate-to-vigorous physical activity per day for youth ages 12-15, but only approximately one quarter of youth in the U.S. meet these levels, with 7.6% of youth not engaging in any physical activity (Fakhouri et al. 2014).[1] The differences between the activity levels of girls and boys were not significant; however, more boys (27.0%) than girls (22.5%) engaged in moderate-to-vigorous physical activity for 60 minutes daily, and more than one-half (60.2%) of boys and approximately one-half (49.4%) of girls engaged in moderate-to-vigorous physical activity on five or more days per week (Fakhouri et al. 2014).

Why It Matters

Obesity prevalence in the United States is a public health concern in that obesity is linked with higher rates of chronic diseases such as cardiovascular disease, type 2 diabetes, stroke, and certain types of cancer as well as higher health care costs (Fogelholm 2009). With a clear upward trend of increasing obesity prevalence in the United States, it is important to consider interventions to reduce obesity and related negative health

[1] Based on self-reported data in the 2012 National Health and Nutrition Examination Survey (NHANES) and the NHANES National Youth Fitness Survey.

outcomes. Major contributors to obesity include policy, such as federal subsidies for certain foods over others and nutrition labeling requirements, as well as built environment factors, such as lack of access to healthy foods and places in which to be physically active (Hipp, Eyler, and Kuhlberg 2012). The World Health Organization ranked physical inactivity as the fourth highest of nineteen mortality risks globally (Montes et al. 2012), and there is other evidence of a link between sedentary lifestyles and obesity, poor health, diabetes, and other metabolic diseases (Levine 2011). Other research such as that of Lopez and Hynes acknowledges the built environment's role in discouraging physical activity, recreation, and social interaction and points out the different needs between inner cities and suburban populations (Lopez and Hynes 2006).[2]

Research has indicated the benefits of physical activity for reducing the risk of chronic health conditions. Walking and cycling for daily travel specifically have been shown to have population-level health benefits (John Pucher et al. 2010). Several researchers to date have acknowledged the potential of open streets initiatives as a public health intervention to encourage increased physical activity (Montes et al. 2012, Kuhlberg et al. 2014). Thus, while many factors other than physical inactivity contribute to obesity and negative health outcomes, encouraging increased physical activity among all population groups is an option to combat the obesity prevalence in the U.S. Accordingly, considering the facts that large numbers of both adults and youth are not meeting the recommended physical activity levels and are also obese, public health interventions to increase activity are an important step to reducing the obesity prevalence nationwide.

While encouraging physical activity and decreasing obesity are both important elements of improving the health of the entire population, it is clear that certain subpopulations in the U.S. experience higher health burdens. As discussed above, minority groups, especially blacks and Hispanics, generally have higher rates of obesity and physical inactivity than non-minorities. Similarly, individuals living below the poverty level have higher obesity prevalence than those living above the poverty level, especially women. These are both factors that are part of an individual's social determinants of health, which are the social, economic, and physical conditions in the environments in which people are born, live, learn, work, worship, and play that affect their health, functioning, and quality-of-life outcomes as well as risks. Healthy People 2020 emphasizes the importance of addressing these and other social determines of health as one of the four overarching goals, "Create social and physical environments that promote good health for all"
(Office of Disease Prevention and Health Promotion 2015c). Thus, when implementing healthy interventions, it is essential to ensure that the interventions are inclusive of the range of individuals living in an area as appropriate.

[2] For example, while inner cities have higher densities which many researchers would suggest encourages physical activity, distressed housing, vacant lots, and abandoned buildings may deter people from being physical active in their surrounding environment; conversely, low density suburbs may lack a safe sidewalk or trail network that would enable physical activity and thus individuals have to seek opportunities to be physically active other than in their surrounding environment. This paper does not focus on the different needs of inner city versus suburban populations.

Behavior Change Theories

While research has clearly indicated that there is a need for increased and sustained physical activity to improve human health outcomes, it is important to consider how and why people change behaviors in order to implement effective interventions aimed at increasing activity levels across all populations. There are several theories that examine how and why humans modify their behaviors. These include the health belief model, theory of reasoned action, theory of planned behavior, social cognitive theory, and the health action process approach (HAPA). The theories each examine various factors that influence individuals' behavioral intentions, which, once understood, public health interventions can then be designed to target and change these beliefs or the values placed on them. While each theory can be described independently, often efforts to change behavior consider a combination of theory and approaches.

Health Belief Model

The health belief model considers the attitudes and beliefs of individuals in order to predict behaviors. There are several factors that comprise the HBM to predict behavior, including the perceived threat (both an individual's susceptibility and the severity), perceived benefits, perceived barriers, cues to action, other external variables, and self-efficacy (Behavioral Research Unit 2002). Past research has evaluated each factor as it relates to behavior change, and in the 1980s, a focus on an individual's self-efficacy, or their belief in being able to successfully complete a behavior, emerged (Champion and Skinner 2008, 50). The self-efficacy research essentially theorizes that without an individual feeling competent, they won't be able to overcome perceived barriers to achieve the desired outcomes.

Theory of Reasoned Action and Theory of Planned Behavior

The theory of reasoned action (TRA) and theory of planned behavior (TPB) both focus on individual motivational factors and predict behaviors based on an individual's behavior intention, which is formed by attitude and social norms (Montano and Kasprzyk 2008, 68). In other words, both TRA and TPB go beyond the health belief model and also consider subjective norms, shaped by normative beliefs and motivation to comply with a behavior, as influential to an individual's intention to perform the behavior. Normative beliefs combine both an individual's perception of other people's opinions of a behavior (i.e., norms) as well as the person's willingness to conform to those views (Behavioral Research Unit 2002). Theory of planned behavior also considers an individual's perceived control over performing the behavior, assuming it is not entirely up to the individual whether they may successfully complete the behavior despite their intention to perform the behavior (Montano and Kasprzyk 2008, 70). Accordingly, according to the theory of planned behavior, behavior change is influenced by an individual's own behavioral beliefs and normative beliefs as well as their perceived control over success.

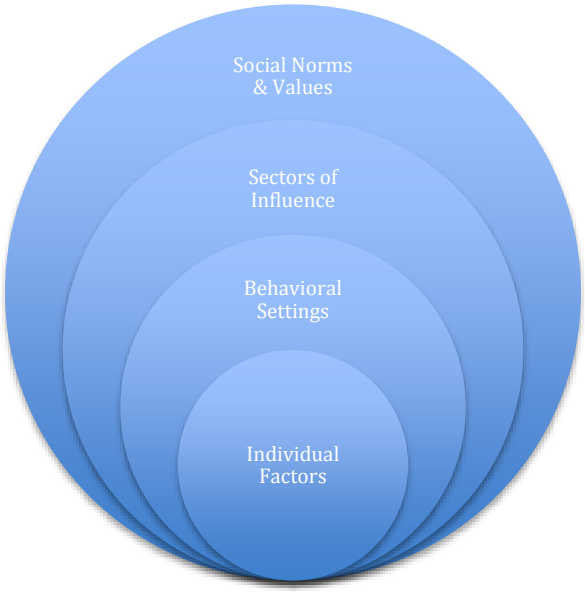
Social Cognitive Theory

Social cognitive theory views human behavior as the outcome of the dynamic interplay of personal, behavioral, and economic influences, and it recognizes that there is reciprocal determinism between people and their environments (McAlister, Perry, and Parcel 2008).

The concept of reciprocal determinism posits that while environmental factors influence individuals and groups, humans also influence their environment and can regulate their own behavior. In addition, various tools, resources, or simply changes to the physical environment may make a behavior easier to perform. Other key concepts of social cognitive theory include psychological determinants of behavior (which is comprised of similar concepts in the above mentioned theories of self-efficacy, collective efficacy, and outcome expectations), observational learning, self-regulation, and moral disengagement (i.e., internalizing moral standards to self-regulate and avoid harmful activities) (McAlister, Perry, and Parcel 2008, 170-171). Observational learning, which expands on an earlier behavior change theory of social learning, recognizes humans can learn behaviors through observing others performing them, whether in-person or through media displays. Research has indicated that observers are more likely to imitate a modeled behavior if they perceive the model as similar to themselves and are motivated by the outcome expectations of the costs and benefits of the observed behavior (McAlister, Perry, and Parcel 2008, 173). Overall, social cognitive theory provides a basis for implementing a broad range of potential interventions to change behaviors.

The social ecological model used by the Center for Disease Control and Prevention (CDC) for several health interventions (e.g., CDC Framework for Preventing Obesity) presents behavior change as shaped by several complex forces at varying levels and essentially represents the social cognitive theory (Schneider 2011). Figure 2 illustrates the model and how the components combine to influence behavior. This framework is useful for visualizing where to target various actions to modify behavior.

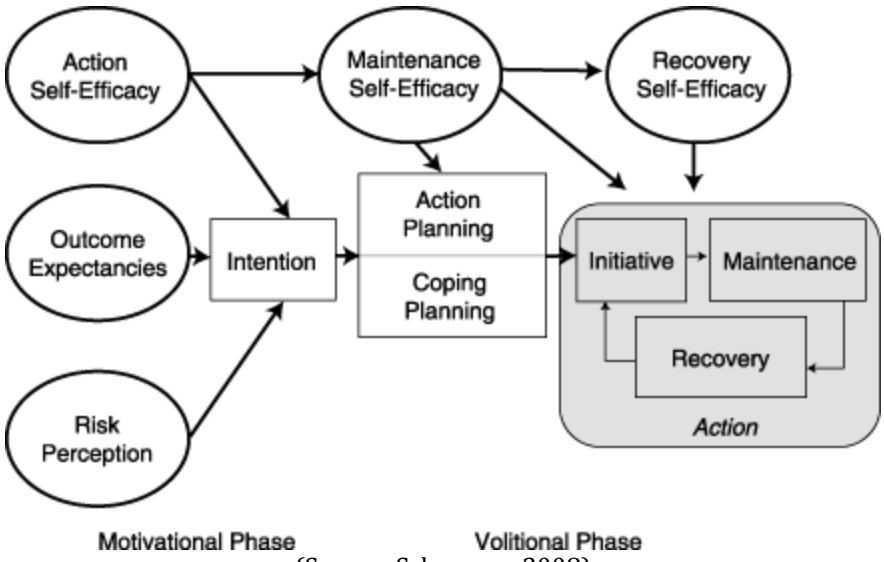
Figure 2. CDC Social Ecological Model



Health Action Process Approach

The health action process approach (HAPA) is another psychological behavior change theory that suggests a structured process to modify behaviors that occurs in two stages rather than along a continuum from intention to behavior as in the above models. The process begins with the motivational phase wherein an individual forms their intention and is followed by the post-intentional, volitional phase wherein intention is translated into action (Schwarzer 2008). HAPA recognizes that for lasting behavior change to occur, the intention must be planned for maintained and that this process may be iterative. This requires an individual to engage in maintenance or coping self-efficacy, which represents the person's ability to adapt and overcome barriers, as well as recovery self-efficacy, which requires the individual to recover after experiencing failure or a setback (Schwarzer 2008). Figure 3 presents a generic process diagram of HAPA, noting the two major stages (pre-intentional and post-intentional) and their components.

Figure 3. Generic Diagram of the Health Action Process Approach



(Source: Schwarzer 2008)

Open Streets Initiatives

There is an increasing body of literature on the benefits specific to open streets initiatives and evaluations of existing and past programs. In summarizing their 2014 research on open streets initiatives across the U.S., Hipp et al. noted that policy makers as well as health and community advocates acknowledge open streets initiatives as being beneficial to *social, environmental, and community health* (Hipp et al. 2014). Different aspects of open streets initiatives have been evaluated including why different organizations and/or cities host the events, who attends, health impacts, economic impacts, and social capital impacts. The following sections summarize this literature.

Why Are They Held

Within the United States, open streets events are held for a variety of reasons, from encouraging physical activity to promoting economic development (Eyler, Hipp, and Lokuta 2014, Hipp, Eyler, and Kuhlberg 2012, Kuhlberg et al. 2014). In addition, activity hubs can

be set up along the route to promote behaviors such as less common physical activities (yoga, dance classes, etc.) (Hipp et al. 2014). Each city decides the route of its open streets event based on its own decision-making criteria, and each event has to comply with different administrative processes and policies specific to the city in which it is held.

Hipp et al. evaluated the reasons open streets initiatives had been held across the United States and found that to provide an opportunity for physical activity is the most common reason events are held (Hipp et al. 2014). Other reasons included to highlight active transportation and other community assets such as parks by incorporating them into the route to promote community awareness, to promote social and community health by connecting people in ways they are not usually connected, and to stimulate a local or neighborhood economy. The mayor's office of St. Louis started hosting its open streets events in 2010 to highlight assets of the city and to encourage physical activity (Hipp, Eyler, and Kuhlberg 2012). First-time participants in San Francisco's Sunday Streets ranked the social environment as one of the most important reasons that they participated, and those participants that attended multiple events ranked the sense of vitality and positive experience as the most important reason they participate (Hipp et al. 2014).

The 2012 National Health and Nutrition Examination Survey (NHANES) and the NHANES National Youth Fitness Survey data include information about the most common physical activities of boys and girls outside of physical education classes. The surveys found that the most common activity types vary between boys and girls aged 12-15 years, with basketball being the most common for boys (48.0%) and running being the most common for girls (34.9%) (Fakhouri et al. 2014). However, many youth are engaging in activities facilitated by open streets initiatives, namely running, walking, and bike riding. For boys aged 12-15 years, 33.5% reported running (the second highest activity), 24.0% reported bike riding (the fourth highest activity) and 23.6% reported walking (5th highest). For girls, running was the most common activity followed by walking (27.6%), and bike riding was the fifth most common with 18.4%. Basketball and dancing were third and fourth most common for girls; both of these activities could be facilitated with activity nodes during an open streets event.

Regardless of the reason(s) for open streets initiatives, it is vital for organizers to establish goals that help measure success of the events and, especially if achieved, support hosting future events (Hipp et al. 2014).

Who Attends Events

Open streets events have the potential to engage a variety of individuals in the target area and encourage them to be physically active and receive social benefits through participation in the event. As open streets initiatives are occurring in higher numbers across the U.S., more event organizers are collecting data on the demographic and socioeconomic characteristics of event attendees. To-date, data has shown that attendees are most often male and adult.

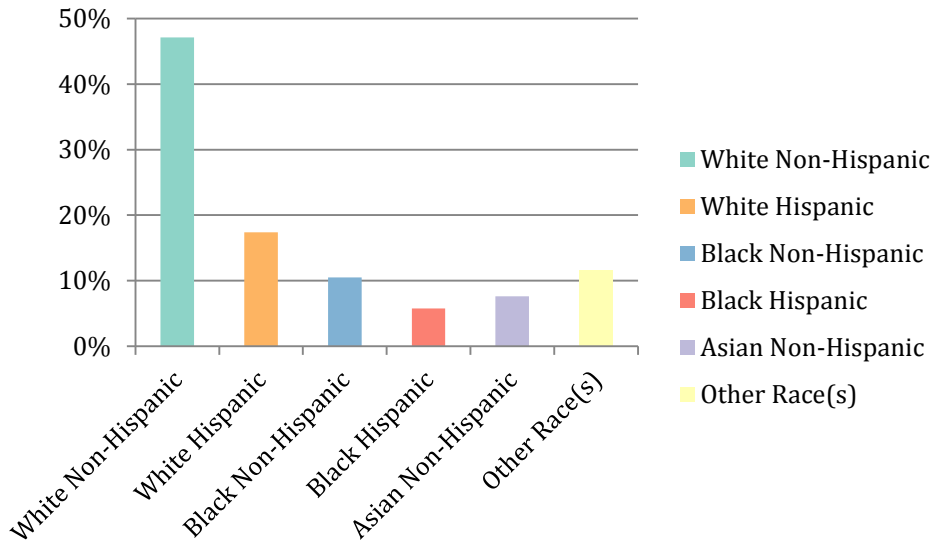
Data from Ciclovia events and CicloRuta bike path network users in Bogota in 2009 found that the majority of participants in both initiatives were men (Torres et al. 2013). (Note the

CicloRuta in Bogota is a bicycle path network that is always available and not simply a weekly event like the Bogota Ciclovias.) Specifically, 70.1% of Ciclovia participants and 87.7% of CicloRuta users were male. Additionally, the research of Torres et al. found that CicloRuta users are more likely to live in lower socioeconomic categories and have lower educational attainment than the city average. Because the CicloRuta network is so expansive, 211 miles as of 2011, it makes it possible for these lower SES individuals to access it (C40 Cities 2011).

Based on observational counts during the St. Louis Open Streets events in 2010, the majority of attendees were adults (86% in April and 80.1% in October) (Hipp, Eyler, and Kuhlberg 2012). In addition, more men than women attended the event in April (42.4% women), but almost half of the October event attendees (49.6%) were women. Of the adults surveyed at the event, 41.6% were women, 86.8% were white, 89% were college graduates, and 80% had a household income over $45,000. Accordingly, there was a gap between those that attended the event and the city of St. Louis population in terms of health disparities (Hipp, Eyler, and Kuhlberg 2012, 1014). Furthermore, of the survey respondents, only 26.25% lived within the city limits, and 48.1% lived outside of the three zip codes that include the city.

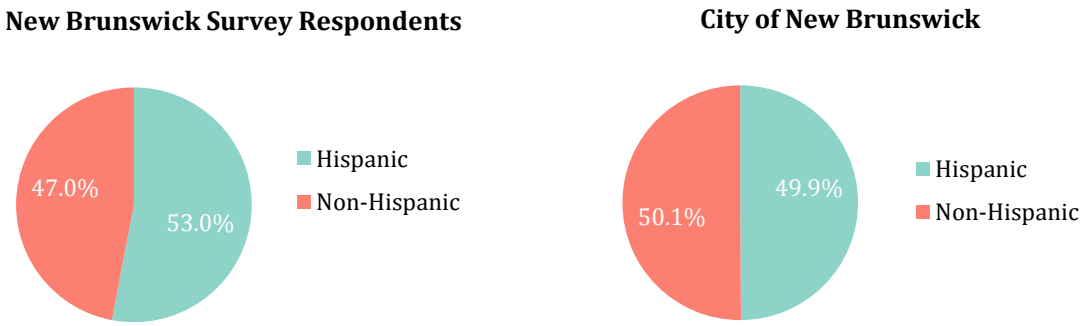
During the October 2013 New Brunswick, New Jersey Ciclovia event, attendees were solicited to complete a survey. Of the event attendees surveyed, males outnumbered female respondents slightly but were similar to the actual population distribution of the city as a whole (Brown and Martin 2013). The age distribution of respondents also was similar to the actual city population, with the exception being more Ciclovia respondents aged 25-34 than the residents and fewer respondents aged 18-24 than residents. However, there were some clear disparities between race and ethnicity groups at the event that completed a survey as well as of the income distribution of the survey respondents when compared to the city population. Figure 4 displays the race and ethnicity of all New Brunswick Ciclovia survey respondents. There were many more non-Hispanic whites in attendance at the Ciclovia than in the city (47.1% versus 27%, respectively), and far fewer Hispanics of some other race attendees than actually in the city (5.8% compared to 25.2%, respectively) (Brown and Martin 2013).

Figure 4. October 2013 New Brunswick, NJ Ciclovia Survey Respondents Race and Ethnicity



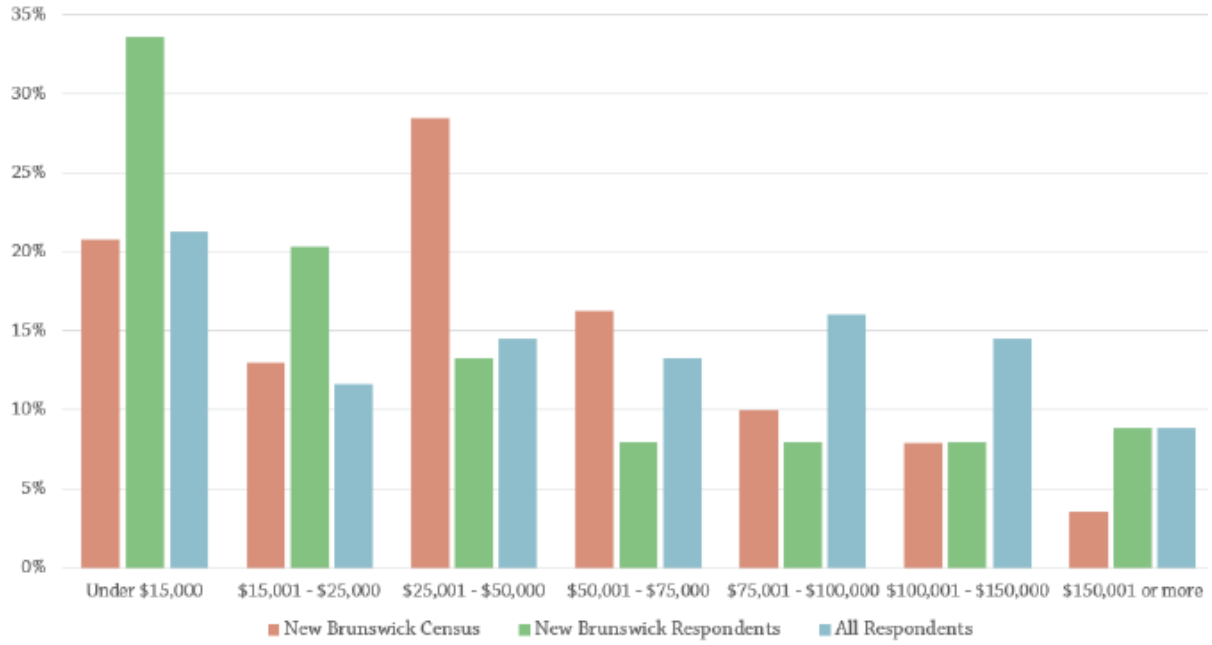
Yet when comparing New Brunswick Ciclovia survey respondents that reported living within the City of New Brunswick to residents of the city as a whole, the Hispanic population at the event was much more representative of the city, as shown in Figure 5 (Brown and Martin 2013).

Figure 5. Comparison of Hispanic Ethnicity of Survey Respondents at October 2013 New Brunswick Ciclovia to City of New Brunswick



With regards to income, respondents with an income less than $25,000 comprised over half of survey respondents compared to less than 40% of the population, whereas respondents in the income ranges between $25,001-$100,000 were significantly lower than the New Brunswick census data (Brown and Martin 2013, 27). Refer to Figure 6 for a graphical representation of the income distribution.

Figure 6. October 2013 New Brunswick Ciclovia Survey Respondents Income Distributions Compared to City Population



(Source: Brown and Martin 2013, 27)

Because the survey was optional, the disparities between socioeconomic and demographic groups at the event compared to the New Brunswick population may not be as pronounced as the survey results indicate. Nonetheless, the evaluation report for the October 2013 New Brunswick Ciclovia, which included collecting and analyzing demographic and socioeconomic information from event attendees, enables New Brunswick Ciclovia organizers to target underrepresented populations to attend future events and to monitor changes in the demographic and SES characteristics of future Ciclovia attendees from those at past events.

Health Impacts of Open Streets Initiatives

A predominant health outcome of open streets initiatives is the increased levels of physical activity for participants. Physical activity and social capital have been demonstrated to be strongly related with health (Torres et al. 2013). As well as collecting data on the demographic and socioeconomic characteristics of open streets event attendees, more event organizers and researchers are also compiling information on the transportation modes and physical activity levels of event attendees.

Based on observations and intercept surveys during St. Louis open streets events that occurred in 2010 (April and October), cyclists spent 1.75 hours bicycling the route, walkers spent over one hour, and joggers spent just over 30 minutes on average (Hipp, Eyler, and Kuhlberg 2012, 1012). In addition, activity station participants did the activity for an average of 53 minutes.

The breakdown of bicyclists, pedestrians, and users of other travel modes that participated in open streets initiatives varies by city and by time of year for the events with available data. The cities with open streets events with survey data between 2005 and 2010 studied by Montes et al., which included Bogota and Medellin, Colombia; Guadalajara, Mexico; and San Francisco, California, all had higher percentages of bicycle users than pedestrians and skaters/others, with the exception of Bogota, Colombia, which had 46.2% bicyclists compared to 47.9% pedestrians (Montes et al. 2012). Based on observation counts during the April 2010 St. Louis Open streets event, 67.6% of adults and 74.6% of youth were bicycling, and in October, 39.9% of attendees were bicycling (Hipp, Eyler, and Kuhlberg 2012). The majority (72%) of attendees of New Brunswick, New Jersey's Ciclovia in October 2013 were pedestrians compared to only 28% bicyclists (Brown and Martin 2013, 24).

Evaluation of the Sunday Streets initiative in San Francisco found that participants in more than one open streets event had a significant increase of five minutes per day of physical activity (Hipp et al. 2014, S114). Of the open streets participants surveyed in St. Louis, 57% indicated that they would be recreating elsewhere if not at the event, and over 50% already meet the Center for Disease Control and Prevention's (CDC) recommended 75 minutes of physical activity per week (Hipp, Eyler, and Kuhlberg 2012, 1014). Torres et al. found in their evaluation of participants in Bogota's Ciclovia and CicloRuta events held in 2009 that over half (59.5%) of Ciclovia reported meeting recommended physical activity levels during leisure time as well as a large majority (70.5%) of CicloRuta users, the latter of which was mainly due to cycling for transportation (Torres et al. 2013). The survey data compiled by Montes et al. estimated 35.7% physically active adult users at Bogota Ciclovia events, 34.3% in Guadalajara, 62.6% in Medellin, and 43.3% in San Francisco's Sunday Streets (Montes et al. 2012).

In addition to surveying and counting users for mode choices and physical activity habits, Montes et al. evaluated the direct health benefits, by calculating the amount of money a physically active adult saves in annual medical costs for preventing chronic diseases, from open streets initiatives in four cities. Specifically, the average direct health benefit (DHB) per year of hosting an open streets event every weekend was estimated as $626.60 per person in San Francisco, $71.10 per person in Bogota, $68.40 per person in Medellin, and in the range of $51.10-62.70 per person in Guadalajara (Montes et al. 2012).[3] Furthermore, Montes et al. noted their estimates are likely underestimated because they do not include the full wide range of benefits (e.g., improving air quality, increasing social capital, etc.). The study found support for implementing these programs to promote physical activity in urban settings (Montes et al. 2012).

Perhaps more tangible in the short-term for event organizers and city officials is the total of the operation costs and users costs, which were estimated in San Francisco as $1.36 per user per event, or $3,974 per kilometer (or $6,396 per mile) per event (Montes et al. 2012). When compared to the average cost of a midrange gym membership per week in San Francisco of $20.31 per user, the costs of holding open streets events to encourage physical

[3] Costs are U.S. dollars.

activity are substantially lower (note a similar analysis was included for other types of paid physical activities) (Montes et al. 2012). The sensitivity analysis showed that the cost-benefit analysis for San Francisco's Sunday Streets was more sensitive to the direct health benefit and the number of users than to the type of activities and length of the event (Montes et al. 2012).

Economic Impacts of Open Streets Initiatives

The impact of several open streets initiatives on the economy have been evaluated to-date. This is especially relevant information for policy makers that allocate funds to host the events (Montes et al. 2012). Researchers at the University of California Los Angeles (UCLA) Luskin School of Public Affairs performed an economic assessment of the June 2013 CicLAvia event in Los Angeles and found that the event had several positive economic impacts related to increased sales revenue at businesses near the route (DeShazo et al. 2013). Similarly, data from the St. Louis Open Streets events in April and October 2010, and from the San Francisco Sunday Streets events from March through October 2012, found positive economic impacts (Hipp, Eyler, and Kuhlberg 2012, Zieff and Chaudhuri 2013). However, the open streets events did not positively impact all businesses equally. The CicLAvia study found that loyalty businesses such as dry cleaners and hair salons fared less well than other businesses, although businesses that engaged with participants (e.g., via a vending table, music, or low cost decorations) experienced a 57% bump in sales, which equals an average of $2,715 extra per business (DeShazo et al. 2013). The San Francisco Sunday Streets assessment found that restaurants experienced a decrease in walk-in customers, but gift and clothing stores reported an increase in customers (Zieff and Chaudhuri 2013). Furthermore, businesses along certain routes that receive support from residents and merchants had net increases in the average numbers of walk-in customers and customer purchases, but the other routes experienced an overall net decrease.

The extent of the positive economic benefits varied by open streets event location. In Los Angeles, businesses along the route of the June 2013 CicLAvia event with reported data experienced a 10% bump in sales on average (or $407 more per business) during the event compared to another Sunday earlier that month (DeShazo et al. 2013). Extending this figure to the 128 businesses open during the event, $52,444 additional sales may have occurred, which excludes increased sales for mobile businesses and food trucks. Also, according to the headcounts conducted by the researchers in the DeShazo et al. study, one additional person than usual was in each business at all times during the event (DeShazo et al. 2013). For the St. Louis Open Streets in April and October of 2010, 82% of survey respondents reported spending money, and 41% spent over $10.00 (Hipp, Eyler, and Kuhlberg 2012, 1013). Also, 56% of participants surveyed became aware of a new business (store or restaurant) (Hipp, Eyler, and Kuhlberg 2012, 1013). In San Francisco, 44% of the businesses along the March-October 2012 Sunday Streets reported an increase in revenue during events compared to nonevent Sundays, with an average net increase of $466, and 35% of businesses reported no change (Hipp et al. 2014). Furthermore, Hipp et al. found that San Francisco Sunday Streets in 2012 acted as an employment generator with one in five businesses hiring or scheduling additional employees to work on the event day.

Social Capital and Equity Impacts of Open Streets Initiatives

Open streets initiatives have the ability to connect communities that may be otherwise disconnected or separated by elements of the built environment by providing a safe and welcome environment free of vehicles that is accessible to people of all ages, abilities, and cultures. Several open streets initiatives in the U.S. have been assessed for the impacts on social capital, equity, and the community.

The surveys conducted during the St. Louis Open Streets events in April and October 2010 received the following responses (Hipp, Eyler, and Kuhlberg 2012, 1013-1014):

- 89% survey respondents said the event changed their feelings about the city positively
- 74% survey respondents felt the city was more vibrant during the event
- 88.1% survey respondents agreed that St. Louis Open Streets strengthens the local community

Similarly, over one third of the survey respondents at the New Brunswick Ciclovia in October 2013 reported that the event introduced them to areas of New Brunswick with which they were previously unfamiliar (Brown and Martin 2013). In addition, 66.9% of all New Brunswick Ciclovia survey respondents indicated that they consider New Brunswick a great place to live, work, and play, and 74.1% of the respondents that actually reside in New Brunswick indicated as such (Brown and Martin 2013).

For both the St. Louis and New Brunswick event surveys, the majority of respondents reported feeling very safe at the open streets event (91% in St. Louis; 80.9% from traffic and 81.5% from crime in New Brunswick) (Hipp, Eyler, and Kuhlberg 2012, Brown and Martin 2013). In Bogota, Columbia, Torres et al. found that the CicloRuta (bike path network) provides key mobility alternatives that are accessible to lower socioeconomic categories and people without access to a car than Ciclovia events (Torres et al. 2013). Low socioeconomic communities generally have less access to infrastructure (Kuhlberg et al. 2014).

Literature Review Conclusions

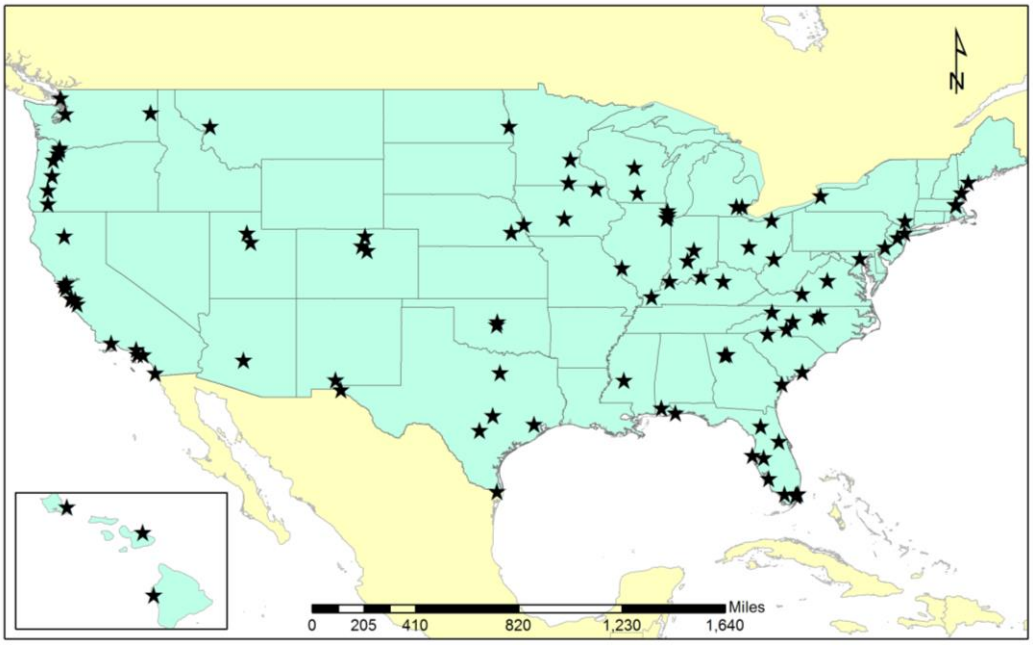
Previous work has demonstrated that open streets initiatives have great potential to positively benefit the health, economy, and social capital of a community in a myriad of ways. Furthermore, opportunities for increased physical activity have the potential to reduce obesity prevalence and other health risk factors among individuals. However, many evaluations of open streets initiatives in the U.S. have indicated that those attending the events are not necessarily representative of the actual city population; specifically, low-income and minority groups are underrepresented. At the same time, given the general feelings of safety and sense of community from people surveyed during open streets events, the initiatives seemingly are welcoming for members of the city population and have the potential to positively connect individuals with others in their community. Thus, a challenge for events in the U.S. is to successfully attract individuals from the range of demographic and socioeconomic characteristics that are representative of the city to open streets initiatives. Accordingly, the subsequent research in this paper will evaluate open

streets events in Atlanta, Georgia in terms of the route accessibility to subpopulations and how these subpopulations represent the city as a whole with an aim to make open streets events more inclusive in the future. In addition, it will consider potential trail and street networks that connect to more of the city's population and create an increased sense of social capital.

Open Streets Events Across the United States

Both the existence and frequency of open streets events across the United States have been increasing over the past several years. Between 2008 and 2014, at least one open streets event had occurred in over 110 cities within the U.S.; Figure 7 displays a map of these cities. As shown in Figure 7, many of the initiatives were in locations with higher population densities.

Figure 7. Map of Open Streets Event Locations Across the United States from 2008 to 2014[4]



The opportunities and challenges to hosting open streets events are unique to each city, and the reasons for starting or stopping regular events vary. Nonetheless, the continued growth in the number of events occurring across the U.S. and within certain cities is clear. Collaborations such as the Open Streets Project (openstreetsproject.org) and conferences such as the Open Streets National Summit have started to form in order to facilitate information gathering and sharing about open streets. The popularity of open streets at the national scale allows for cities and event organizers to share best practices and lessons learned with others across the U.S. to improve implementation of open streets events locally.

[4] Note at least one open streets event occurred in the locations identified in this map between 2008 and 2014, although many locations hosted more than one event.

Atlanta Streets Alive Evolution and Equity Analysis

Atlanta Streets Alive (ASA) events first occurred in 2010, and the events are an organized effort of the Atlanta Bicycle Coalition (ABC). ABC first convened two dozen community leaders to form an Atlanta Streets Alive steering committee in 2010 (Alive 2015). The Atlanta Streets Alive vision statement is *to encourage Atlanta to develop living streets.* Following this vision, ASA events have evolved from two-mile routes occurring twice per year in the same location to routes ranging from three to five miles with rotating locations three times per year over the course of five years.

An Atlanta Streets Alive event lasts for four hours with the route streets completely closed to vehicular traffic (except for emergency vehicles) but with the cross streets remaining open to vehicles and traffic officers facilitating crossings at each intersection. Various participatory activities are spread throughout the route, ranging from short dance classes to crosswalk painting. The ASA organizers do not actually create and lead all of the activities themselves but rather accept proposals from people and businesses within the community to host an activity. Atlanta Streets Alive organizers encourage "fun, engaging, and active activities… that promote movement" (Atlanta Streets Alive 2015a) and requests that activities are participatory (e.g., not handing out fliers) (Atlanta Streets Alive 2015b).

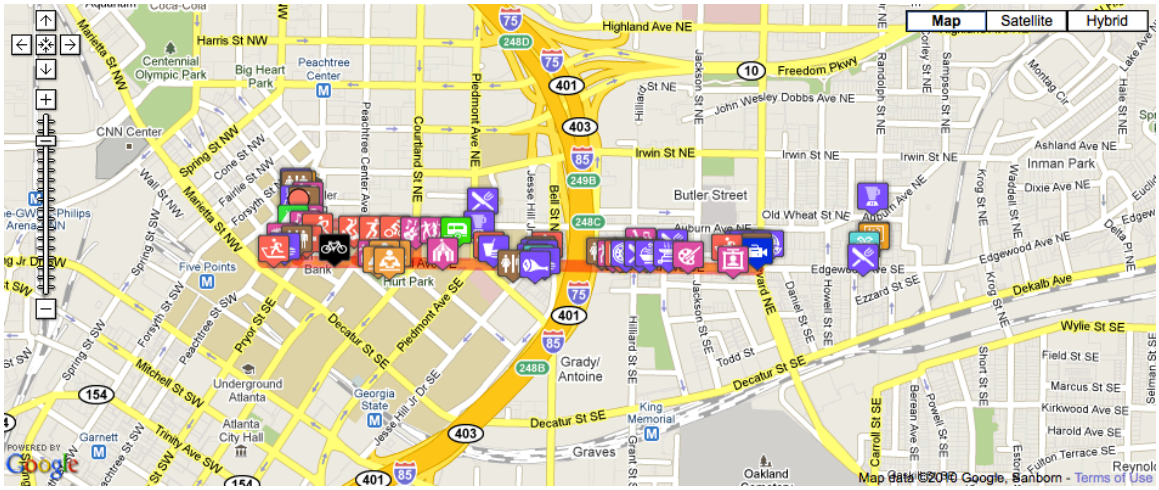
Methodology

To assess the social and health equity of Atlanta Streets Alive, several factors were considered. The analysis is based mapping the locations of past events. Using census tract level population data from the U.S. Census Bureau's five-year American Community Survey from 2009-2013, the demographic and socioeconomic status characteristics of the residents living in census tracts within one-quarter mile of the three 2014 ASA event routes were summarized and compared to the City of Atlanta as a whole. In addition, demographic and SES characteristics from surveys conducted during ASA along each of the three routes were compared to the characteristics of the residential populations. The health equity analysis uses data that ranks the health status of each Neighborhood Planning Unit in Atlanta as well as data on selected social determinants of health as indicators of the health of the population to evaluate access to the event routes.

Brief History of Events

In its inaugural year, Atlanta Streets Alive was held in the spring and fall (May 23, 2010, and October 17, 2010, respectively) along approximately two miles of Edgewood Avenue. Approximately 3,000 people attended the inaugural May 23, 2010 event, but attendance count information is unavailable for the subsequent events in 2010 and 2011. The following year, ASA events occurred on two different Sundays during the month of June (June 11 and 25) over an approximate two-mile route along Edgewood and Auburn Avenues. Figure 8 displays the inaugural Atlanta Streets Alive route map.

Figure 8. Inaugural Atlanta Streets Alive Route



Source: Neighborhood Planning Unit M 2012

In 2012, Atlanta Streets Alive was again held in May and October, but the location was moved farther east of the original routes. The beginning of the Atlanta Streetcar construction has been cited as the main reason for the need to shift the route location (Neighborhood Planning Unit M 2012). Specifically, the May 20, 2012 event was held along two miles of Highland Avenue with 47 activities and saw approximately 14,000 visitors. The October 7, 2012 event occurred on a longer, five-mile route spanning Highland Avenue, Virginia Avenue, and incorporating the Atlanta BeltLine Eastside Trail with over 50 activities and 20,000 attendees. In 2013, Atlanta Streets Alive expanded to three events, with two events along Atlanta's iconic Peachtree Street. The first event of the year was on May 19 on a three-mile portion of Peachtree Street spanning from the Downtown Atlanta neighborhood through Midtown Atlanta with over 20 activities and 15,000 visitors. According to the ABC, the September 8, 2013 Atlanta Streets Alive event along 3.5-miles of Peachtree Street was held due to popular demand. This second event of 2013 had over four times as many attendees as the first (over 67,000 compared to 15,000) and more than double the amount of activities along the route (over 50 compared to 20). The final event of 2013 was held along portions of the 2012 routes, but rather than utilize the Atlanta BeltLine Eastside Trail, the event moved to Monroe Drive and Boulevard. Perhaps building on the success of the September 2013 ASA, the October event had over 82,000 attendees and more than 40 activities along the route.

2014 was the first year that Atlanta Streets Alive held an event in southwest Atlanta in the historic West End neighborhood and Adair Park. The April 20, 2014 event had over 16,000 attendees and over 20 activity stations. A possible reason for the lower number of activities compared to previous events on the Peachtree and Highland routes is the newness of the event to the historic West End neighborhood, and thus fewer individuals and businesses may have been aware of the possibility of hosting an activity and/or uncertain or unfamiliar with how to structure an ASA activity. The May 18, 2014 Atlanta Streets Alive event on Peachtree Street occurred on a rainy day, and the attendance counts of the April event were not matched (approximately 10,000 visitors in May). The final Atlanta Streets

Alive of 2014 was held along Highland Avenue, with slight variations in the route again. This September 28, 2014 Atlanta Streets Alive experienced the largest attendance to-date of 106,000 people with over 50 activities.

Figure 9. Atlanta Streets Alive 2014 Event Routes

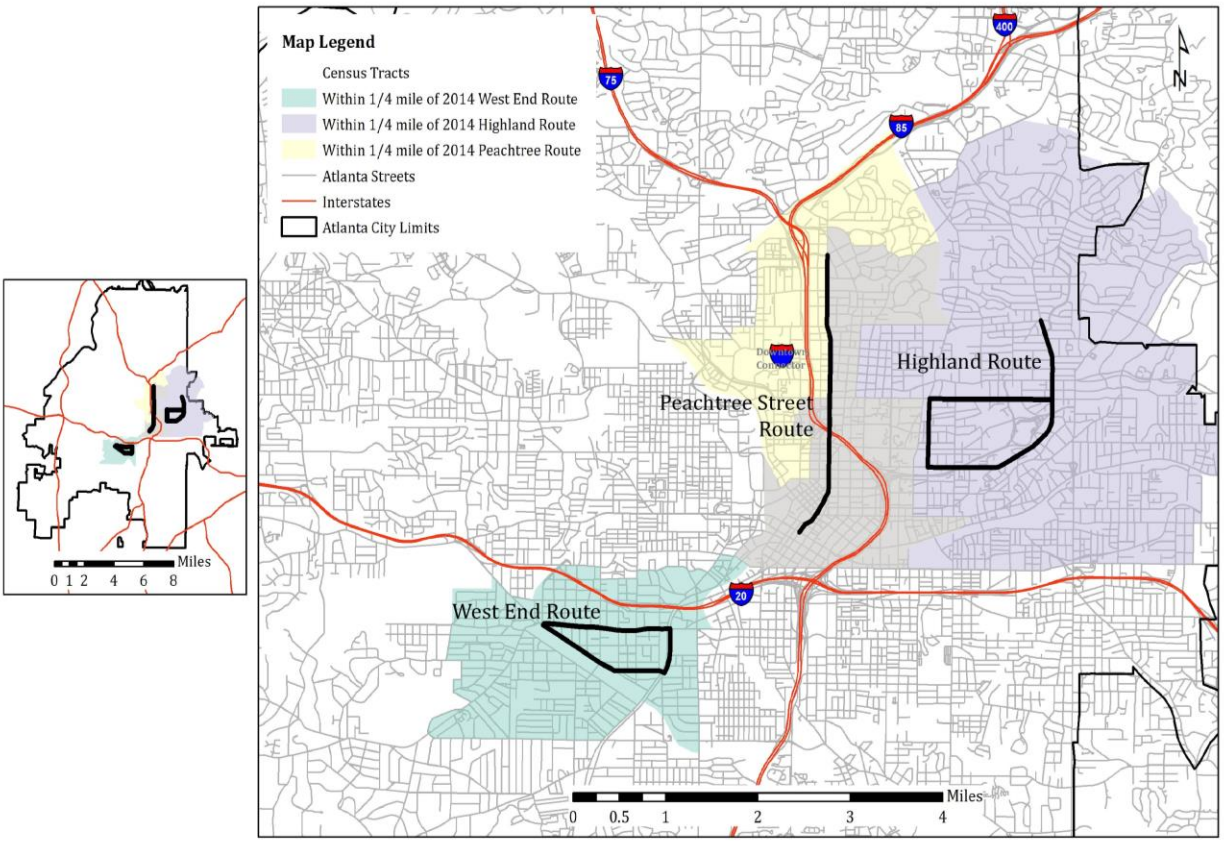


Figure 9a. 2014 Atlanta Streets Alive West End Route Detail

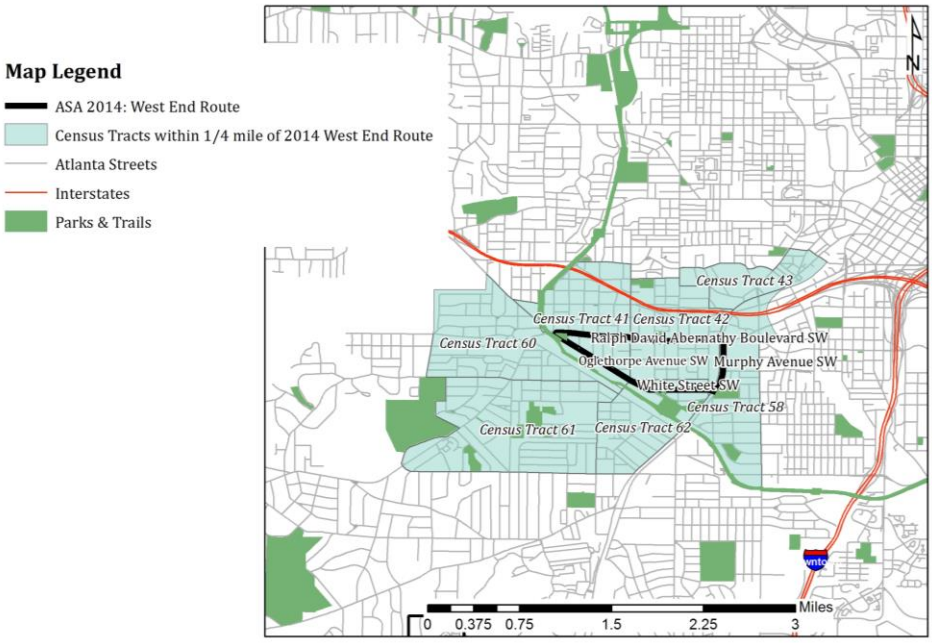


Figure 9b. 2014 Atlanta Streets Alive Peachtree Route Detail

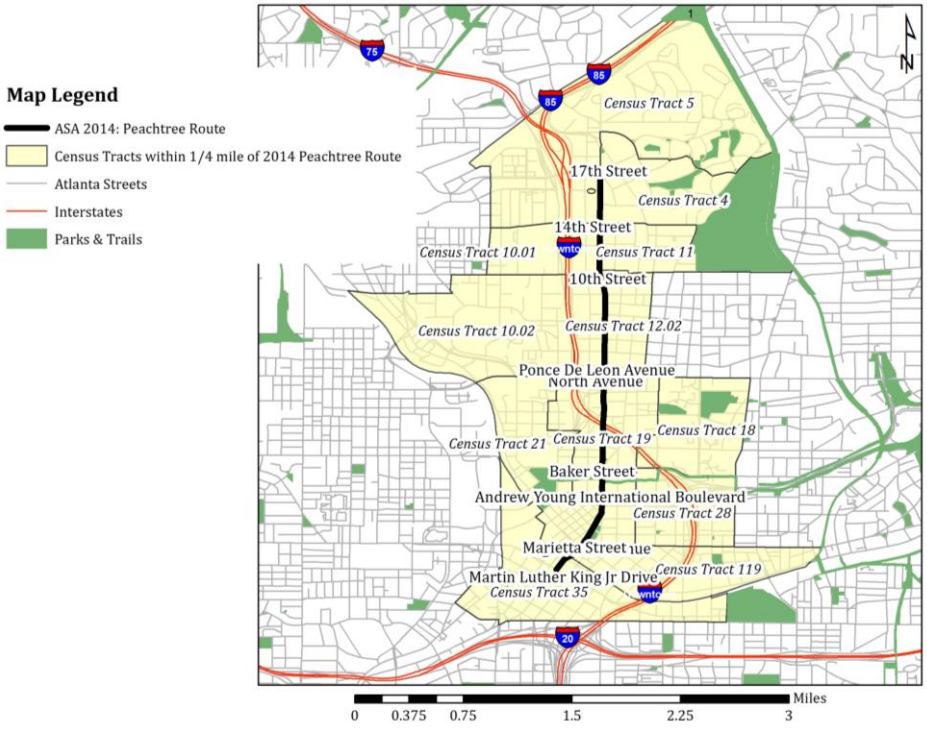
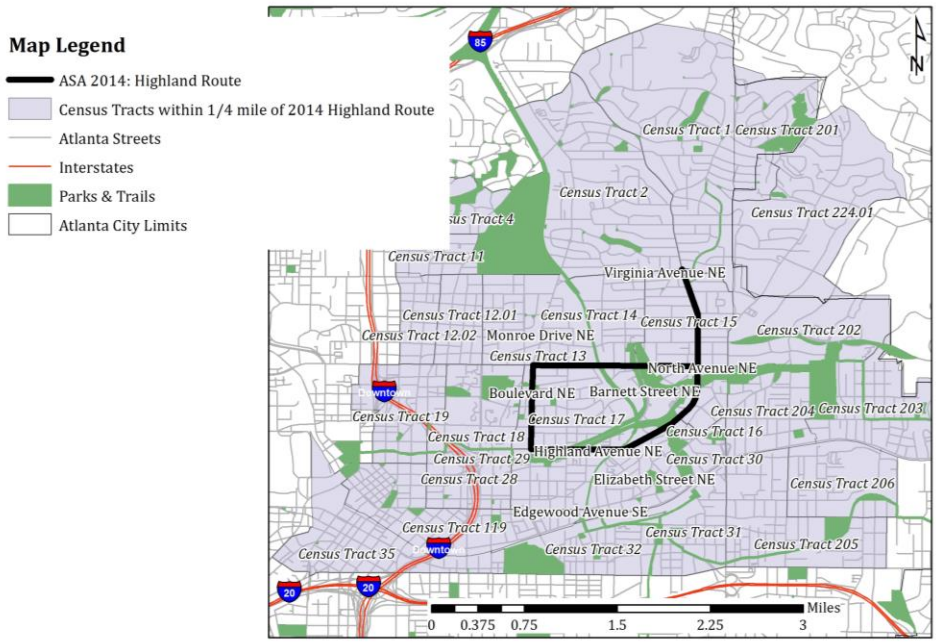


Figure 9c. 2014 Atlanta Streets Alive Highland Route Detail



The plan for 2015 Atlanta Streets Alive events is similar to 2014, with three total events along each of the West End, Highland, and Peachtree routes according to the ASA website: http://www.atlantastreetsalive.com/2015-routes/.`

Table 1 summarizes the past ASA event locations, approximate length, attendance, and number of activities from its inception in 2010 through 2014.

Table 1. Summary of Past Atlanta Streets Alive Events

Event Date	Location	Approximate Length (miles)	Approximate # of Attendees	# of Activities
May 23, 2010	Edgewood Avenue	2	3,000	Unknown
October 17, 2010	Edgewood Avenue	2	Unknown	Unknown
June 11, 2011	Edgewood Avenue + Auburn Avenue	2	Unknown	Unknown
June 25, 2011	Edgewood Avenue + Auburn Avenue	2	Unknown	Unknown
May 20, 2012	Highland Avenue	2	14,000	47
October 7, 2012	Highland Avenue + Virginia Ave + Atlanta BeltLine Eastside Trail	5	20,000	50+
May 19, 2013	Peachtree Street (West Peachtree to Ellis St)	3	15,000	20+
September 8, 2013	Peachtree Street (West Peachtree to Mitchell St)	3.5	67,000	50+
October 6, 2013	Highland Ave + Virgina Ave + Monroe Dr. + Boulevard	5	82,000	40+
April 20, 2014	Historic West End and Adair Park	3	16,000	20+
May 18, 2014	Peachtree Street (West Peachtree to Ellis St)	3	10,000	12
September 28, 2014	Highland Ave + North Ave + Boulevard	5	106,000	>50

Atlanta Streets Alive's Population Reach: Demographic & Socioeconomic Characteristics

Route Location and Atlanta Population Densities

Atlanta Streets Alive events have occurred in areas of Atlanta with different population densities as well as varying demographic and socioeconomic characteristics. Due to the City of Atlanta's large geographic footprint (just over 130 square-miles) compared to the average length of a typical Atlanta Streets Alive route (3.125 miles for ASA events to-date and 3.67 miles for 2014 events only), only a portion of the city's residents live within close walking distance to each event. However, Atlanta Streets Alive should ideally be accessible via active transportation and/or transit to as many residents as possible in order to promote the social and physical benefits of the events.

Based on the most recent residential population data for the census tracts within one-quarter mile of each 2014 (and proposed 2015) ASA route, ASA routes are being located within walking distance of approximately four to ten percent of the total Atlanta population (see Table 2).[5] One-quarter mile is generally considered a minimum comfortable walking distance, although longer distances are also referenced as a comfortable distance to use active transportation (e.g., one-half mile for walking and one mile for bicycling).

Table 2. Comparison of Residential Population within ¼ Mile of Atlanta Streets Alive Event Route to City of Atlanta

	Count	Percent of Total Atlanta Population
Total Atlanta Population	432,589	100%
Population of Census Tracts within 1/4 Mile of:		
Highland 2014 Route	43,349	10.02%
Peachtree 2014 Route	42,343	9.79%
West End 2014 Route	16,980	3.93%

Attendance Counts and Residential Locations

Interestingly, the number of attendees at each ASA event has not always aligned with the number of nearby residents. The portion of the citywide population in attendance at each event has been both above and below the portion of the Atlanta population that lives within one-quarter mile of the event. Table 3 demonstrates this point. Notably, the number of attendees at the 2014 West End ASA event was very similar to the number of nearby residents, whereas the 2014 Highland event had more than double the number of event attendees than residents. Conversely, the 2014 Peachtree event had less than one-fourth as many attendees compared to the percent of the Atlanta population living within nearby walking distance. However, the low turnout at the May 2014 ASA on Peachtree Street, especially after the high attendance count at the September 8, 2013 ASA on Peachtree, was

[5] Data for the 2013 residential population per the U.S. Census Bureau American Community Survey.

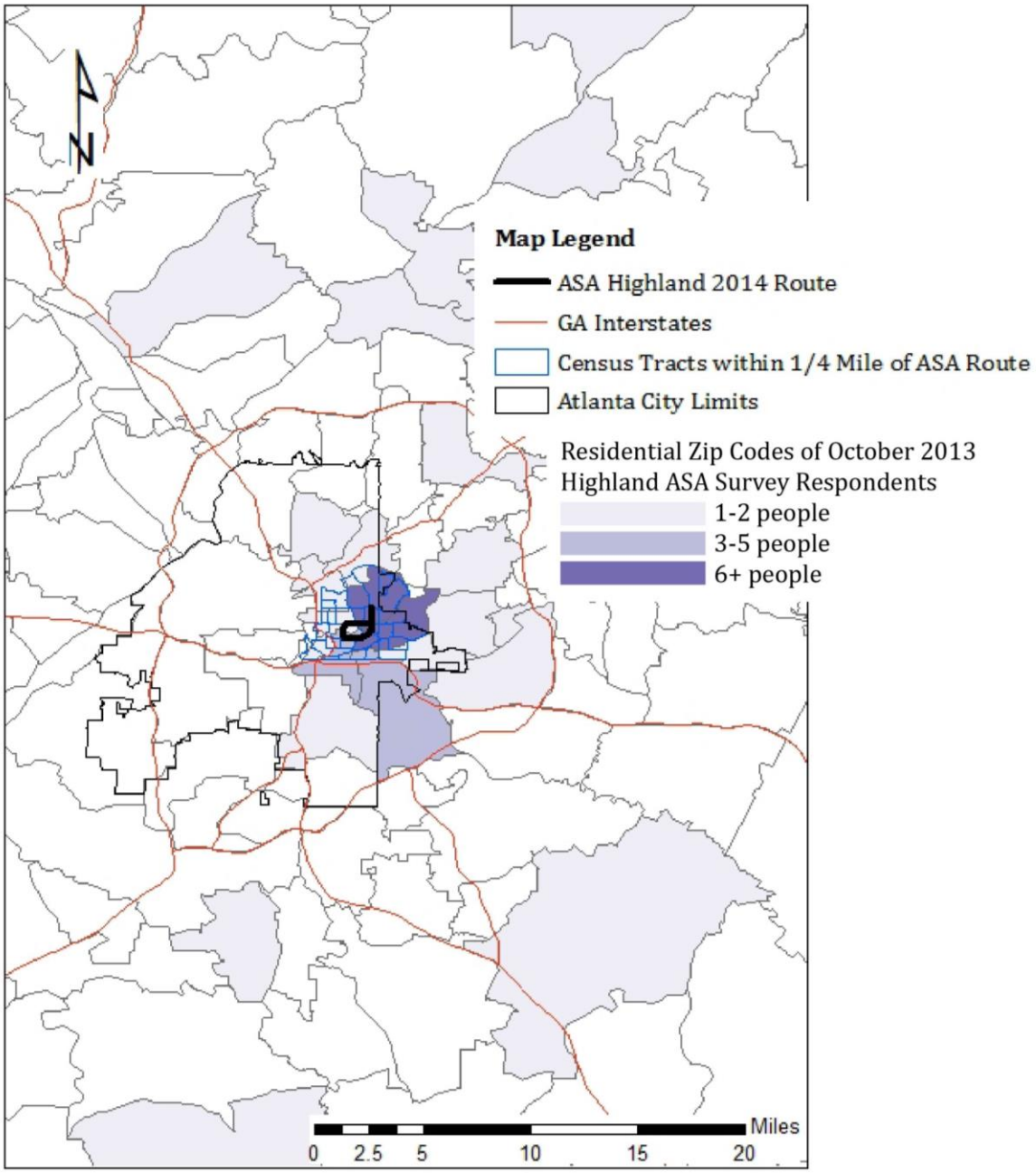
likely due to the weather conditions on the day of the event; ASA coordinators noted that May 18, 2014 was a cold and rainy day.

Table 3. Comparison of Residential Population within ¼ Mile of Atlanta Streets Alive Event Route to Number of Event Attendees

Event Location and Date	Estimated Attendance Count	Attendance as Percent of Atlanta Population	Residential Population within 1/4 Mile (% of Atlanta Total)
Highland Route			
September 28, 2014	106,000	24.5%	10.0%
October 6, 2013	82,000	19.0%	
October 7, 2012	20,000	4.6%	
May 20, 2012	14,000	3.2%	
Peachtree Route			
May 18, 2014	10,000	2.3%	9.8%
September 8, 2013	67,000	15.5%	
May 19, 2013	15,000	3.5%	
West End Route			
April 20, 2014	16,000	3.7%	3.93%

Attendees of ASA events have residential zip codes throughout the Atlanta region, which includes people that do not live within a comfortable walk or bike ride of an ASA route as well as people that reside outside of the Atlanta city limits; this distribution of attendees may account for the variances between attendance counts and number of nearby residents, especially when attendance numbers far exceed the number of residents. Figure 10, Figure 11, and Figure 12 display the residential zip codes represented at recent ASA events based on people surveyed during each event; it is important to note that survey respondents may or may not be representative of all of an event's attendees due to the small survey sample sizes compared to the estimated number of total event attendees. Figure 13 presents the rate of attendance for each zip code averaged for the three events.

Figure 10. Atlanta Streets Alive 2013[6] Highland Route Survey Respondents Zip Codes (n=49)



[6] Survey data was not available for the 2014 ASA event along the Highland route.

Figure 11. Atlanta Streets Alive 2014 Historic West End Route Survey Respondents Zip Codes (n=77)

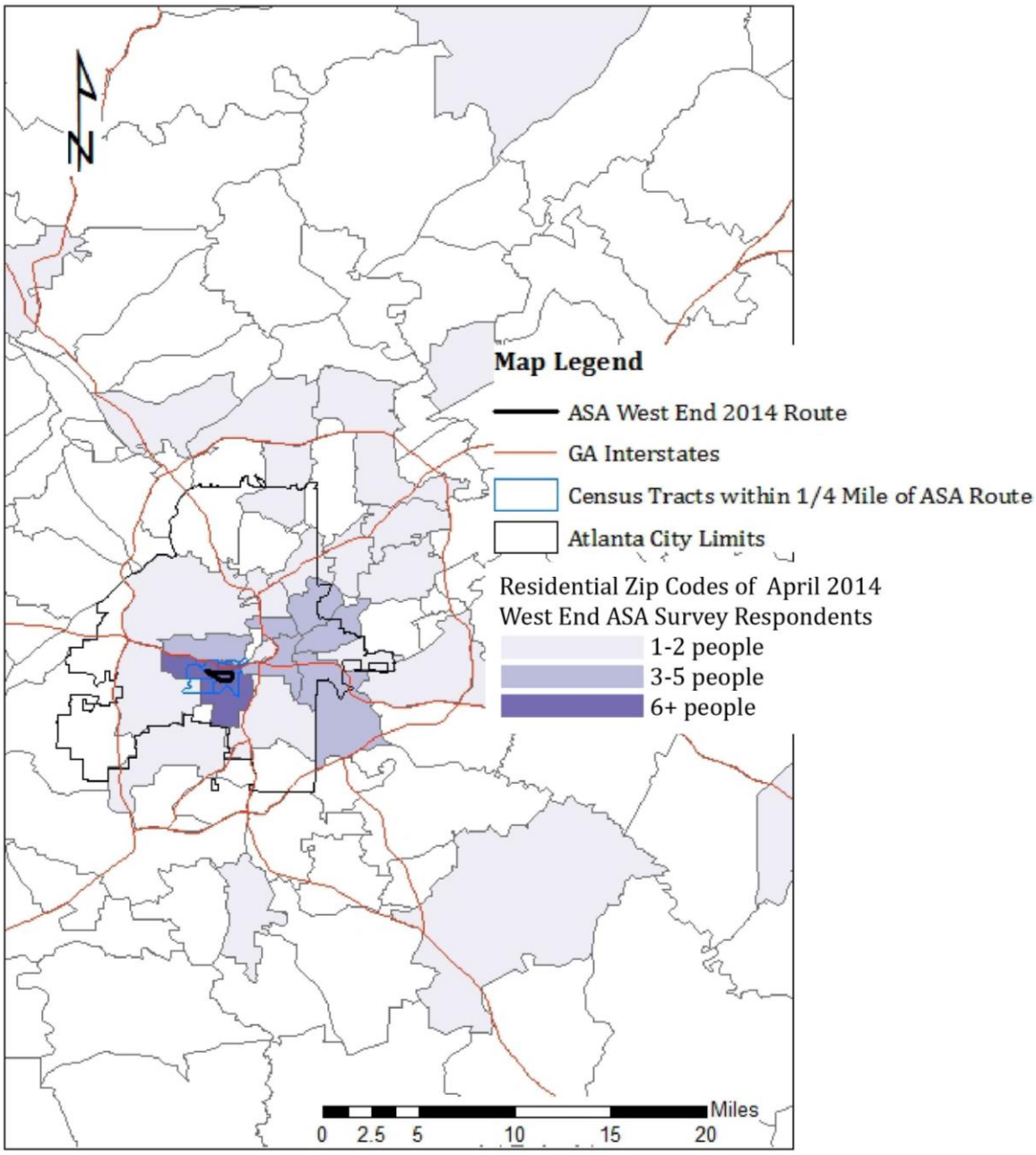


Figure 12. Atlanta Streets Alive 2014 Peachtree Street Route Survey Respondents Zip Codes (n=20)

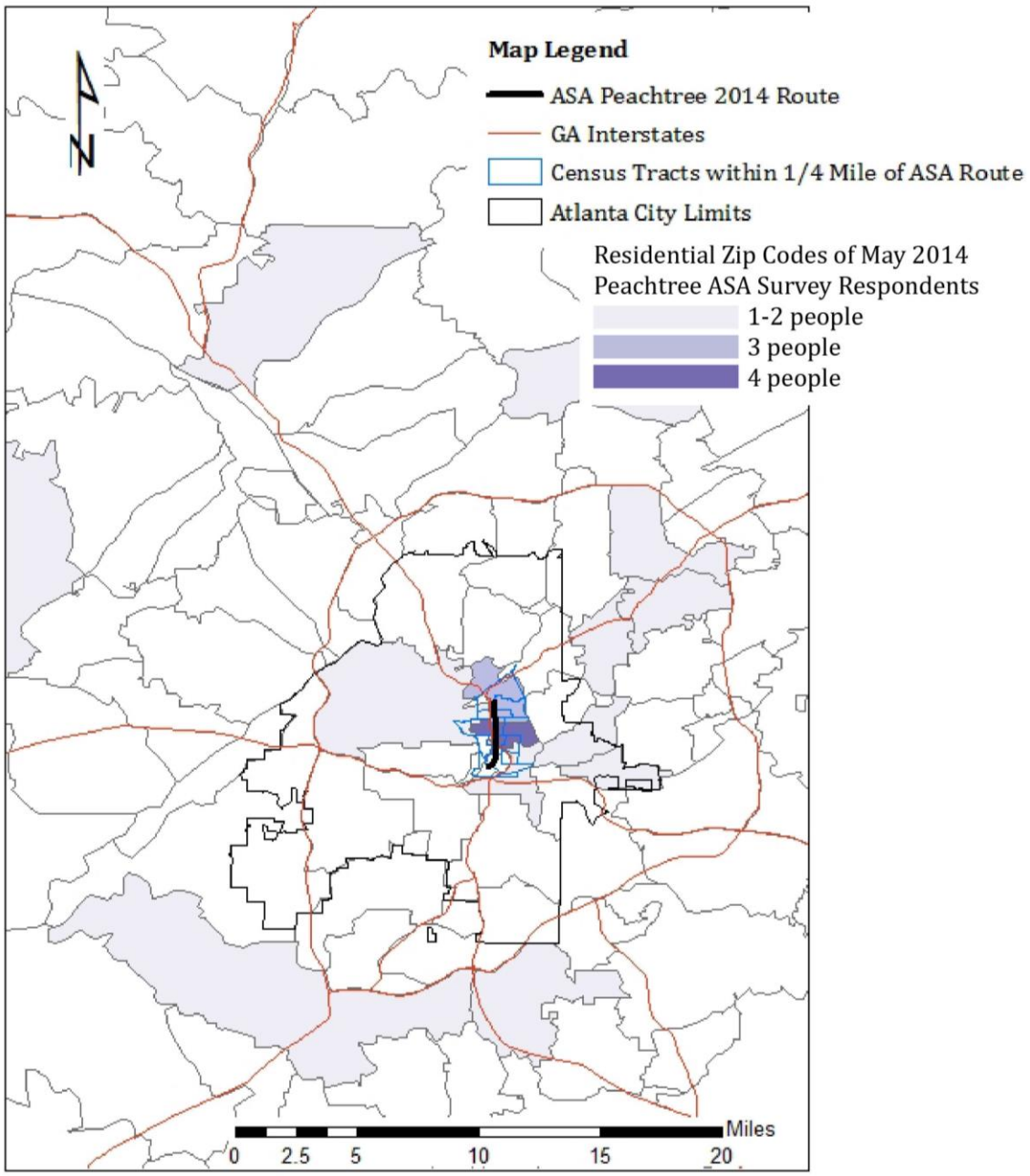
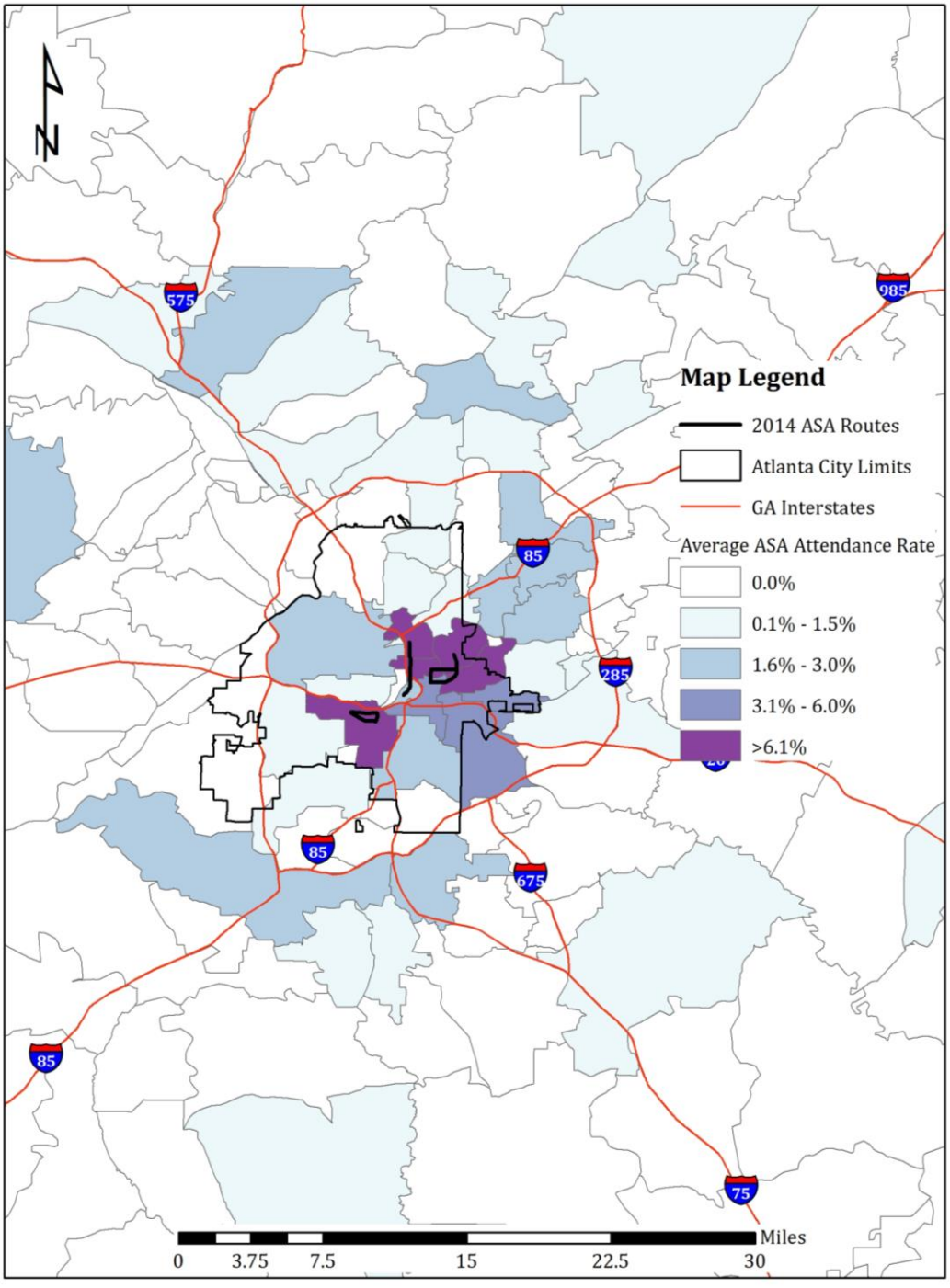


Figure 13. Atlanta Streets Alive Survey Respondents Zip Codes Combined for 2013 Highland, 2014 West End, and 2014 Peachtree Events



Comparison of Atlanta Residents with Atlanta Streets Alive Attendees

Based on the U.S. Census Bureau's American Community Survey data for 2009-2013, residents in the City of Atlanta are majority African American (53.5%) or white (39.3%), and only 5.3% of Atlanta residents are Hispanic or Latino. One quarter of Atlanta's population lives below the poverty level, with a citywide median household income of

$46,631 and mean income of $82,381. The large difference between the median and mean incomes suggests that a smaller percentage of households are earning large amounts compared to the majority of Atlanta households across the city. Of the population over 18 years of age, 12% have less than a high school education, and over half (68%) have some college education or higher.

Demographic and Socioeconomic Status Characteristics of Residents Surrounding Atlanta Streets Alive Routes

The demographic and socioeconomic status (SES) characteristics of the populations living in census tracts within a quarter mile of each 2014 Atlanta Streets Alive route are not representative of the population of Atlanta.[7] However, with the addition of the West End Atlanta Streets Alive route in 2014, the events were held in locations with demographic characteristics and SES both above and below Atlanta's average education attainment level, household income, race, and age ranges.

A summary of noteworthy observations for each route is as follows:

- The census tracts surrounding the Highland Avenue routes (specifically those surrounding the five-mile 2014 route) are the least representative of the citywide population. Residents of the Highland census tracts are predominately white (70%), highly educated – 61% have a bachelor's degree or higher and 24.5% have some college education – and between the ages of 25 and 54. In addition, 17% of the Highland route population is living below the poverty level, which is lower than the citywide population below the poverty level of 25%.
- The population within a quarter-mile of the West End route is almost 90% African American, has the lowest percentage of Hispanic or Latino residents of any of the three routes (1.86%, which is also low compared to the citywide average of 5.34%), and less than 15% of the residents have a bachelor's degree or higher. In addition, both the median and mean household incomes are below the incomes across the City of Atlanta.
- The census tract populations living with one–quarter mile of the Peachtree route are similar to those near the Highland route, but for the most part, the socioeconomic and demographic characteristics of the Peachtree area residents are the most like the citywide characteristics out of all three ASA routes.

The table and figures on the following pages present the demographic and SES information for the residents surrounding the existing ASA routes.

[7] Note one-quarter mile was assumed to be comfortable walking distance for this analysis.

Table 4. Comparison of Socioeconomic Factors Along Atlanta Streets Alive Routes and the City of Atlanta, Georgia

Statistic	City of Atlanta	2014 Highland Route Average[1]	Difference	2014 Peachtree Route Average[1]	Difference	2014 West End Route Average[1]	Difference
Education							
Less than High School	12.05%	3.74%	-8.31%	5.53%	-6.52%	22.74%	10.68%
High School Graduate	19.94%	10.62%	-9.32%	10.92%	-9.02%	28.14%	8.20%
Some college or associate	26.86%	24.46%	-2.40%	37.65%	10.79%	34.41%	7.55%
Bachelor's degree or High	41.15%	61.18%	20.03%	45.90%	4.75%	14.75%	-26.40%
Economics							
Median Household Incom	$46,631	$65,341	$18,710	$52,032	$5,401	$22,836	($23,795)
Mean Household Income	$82,381	$97,854	$15,473	$76,439	($5,942)	$36,094	($46,287)
Percent of Population Bel	25.00%	16.69%	-8.31%	29.24%	4.24%	38.31%	13.31%
Race and Ethnicity							
White only	39.34%	70.37%	31.04%	53.36%	14.02%	7.33%	-32.01%
Black or African Americar	53.54%	22.01%	-31.54%	31.95%	-21.59%	88.79%	35.24%
American Indian or Alask	0.16%	0.12%	-0.04%	0.50%	0.34%	0.05%	-0.11%
Asianonly	3.62%	4.18%	0.55%	10.87%	7.24%	1.11%	-2.51%
Native Hawaiian or Pacifi	0.03%	0.00%	-0.03%	0.09%	0.06%	0.05%	0.02%
Two or More Races	1.86%	2.26%	0.41%	2.43%	0.58%	2.43%	0.57%
Hispanic Ethnicity							
Hispanic or Latino	5.34%	5.08%	-0.26%	4.65%	-0.69%	1.86%	-3.48%
Not Hispanic or Latino	94.66%	94.92%	0.26%	95.35%	0.69%	98.14%	3.48%
Age							
Under 18	18.91%	12.58%	-6.33%	5.68%	-13.23%	22.81%	3.90%
Ages 18 to 24	14.64%	13.00%	-1.64%	31.27%	16.63%	20.36%	5.72%
Ages 25 to 34	19.59%	26.92%	7.33%	23.85%	4.26%	10.73%	-8.86%
Ages 35 to 44	14.91%	18.65%	3.73%	13.03%	-1.89%	12.20%	-2.72%
Ages 45 to 54	12.48%	13.35%	0.88%	12.67%	0.19%	13.43%	0.95%
Ages 55 to 64	9.51%	9.82%	0.30%	8.73%	-0.78%	10.57%	1.05%
Ages 65 to 74	5.65%	3.67%	-1.97%	3.27%	-2.38%	6.16%	0.51%
Ages 75 and over	4.31%	2.01%	-2.30%	1.50%	-2.82%	3.74%	-0.57%

1. The route average is for the census tracts within one-quarter mile of the ASA event route.

Figure 14. Education Level Distribution of Residents Surrounding ASA 2014 Event Routes

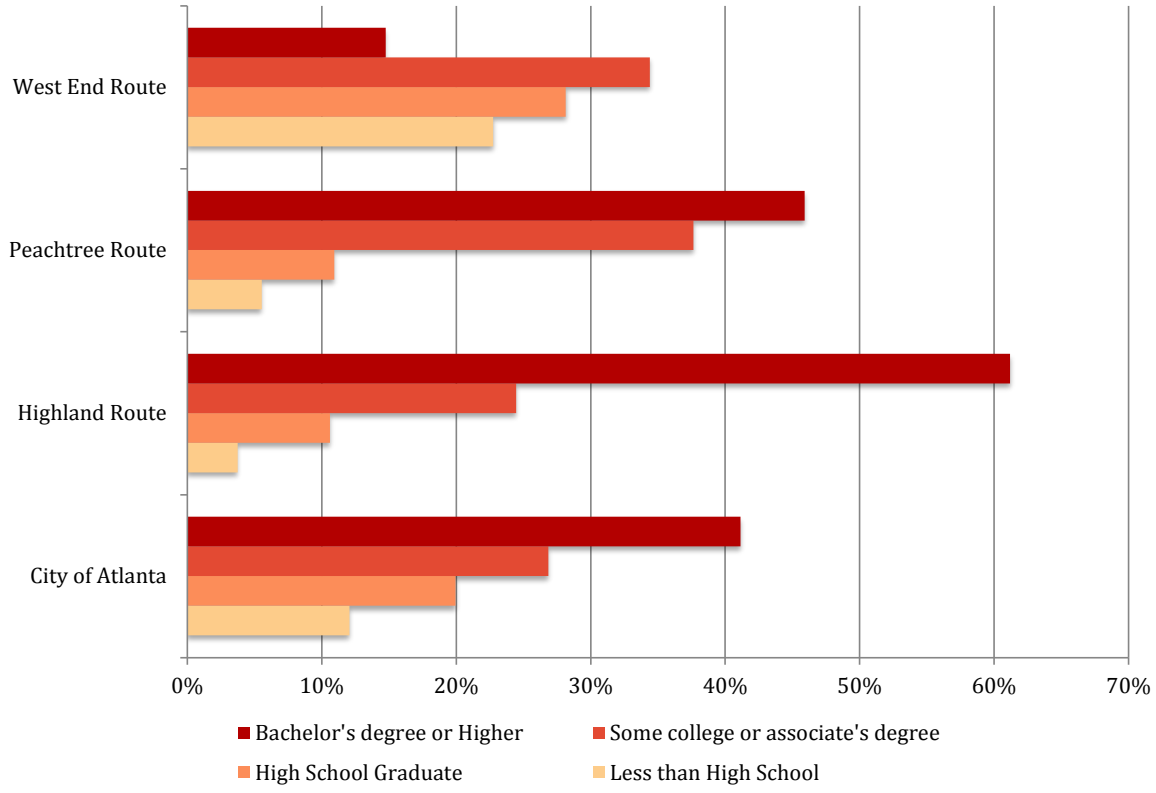


Figure 15. Income Distribution of Residents Surrounding ASA 2014 Event Routes

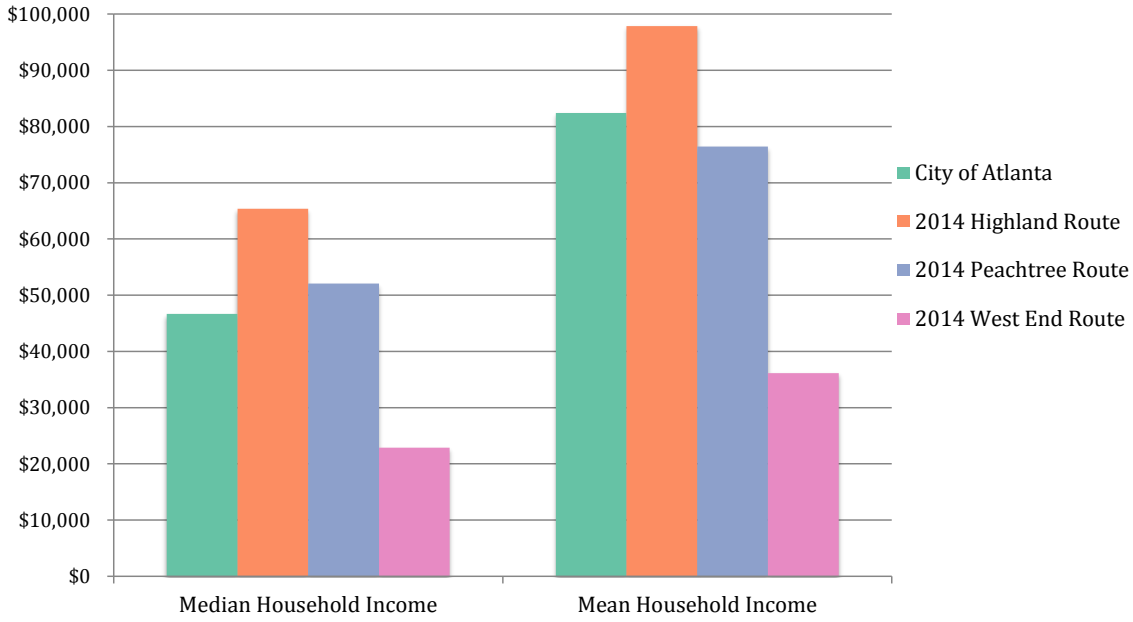


Figure 16. Race Distribution of Residents Surrounding ASA 2014 Event Routes

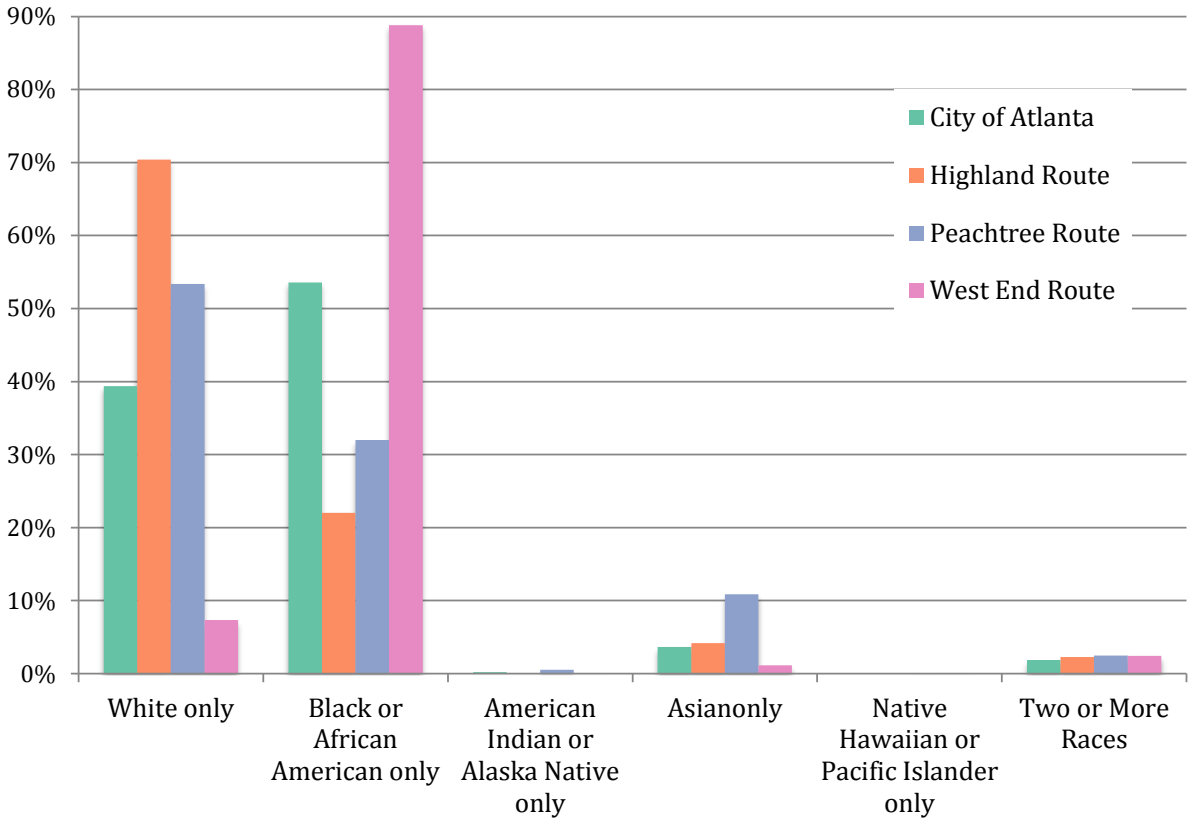


Figure 17. Hispanic or Latino Ethnicity Distribution of Residents Surrounding ASA 2014 Event Routes

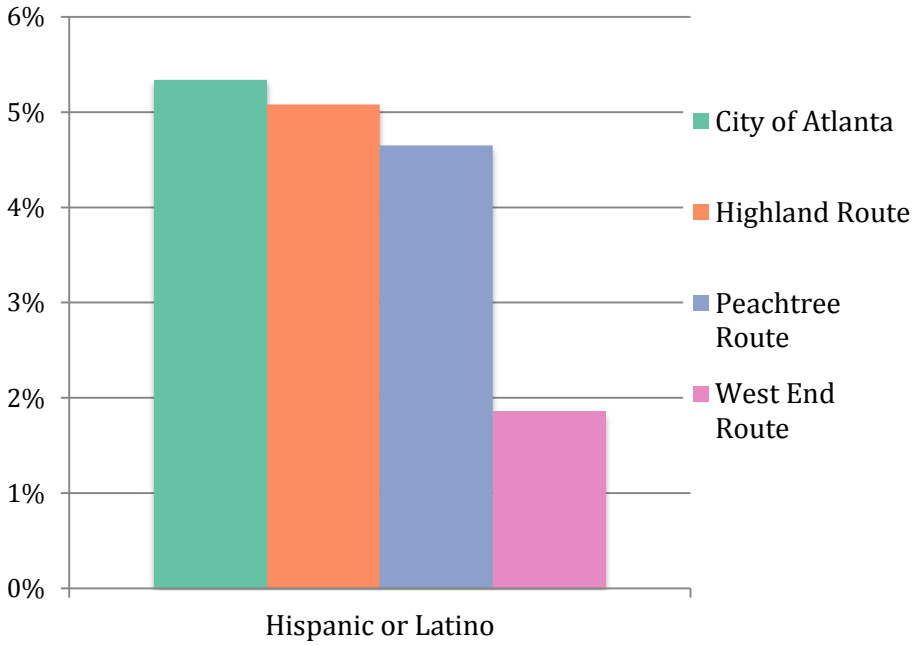
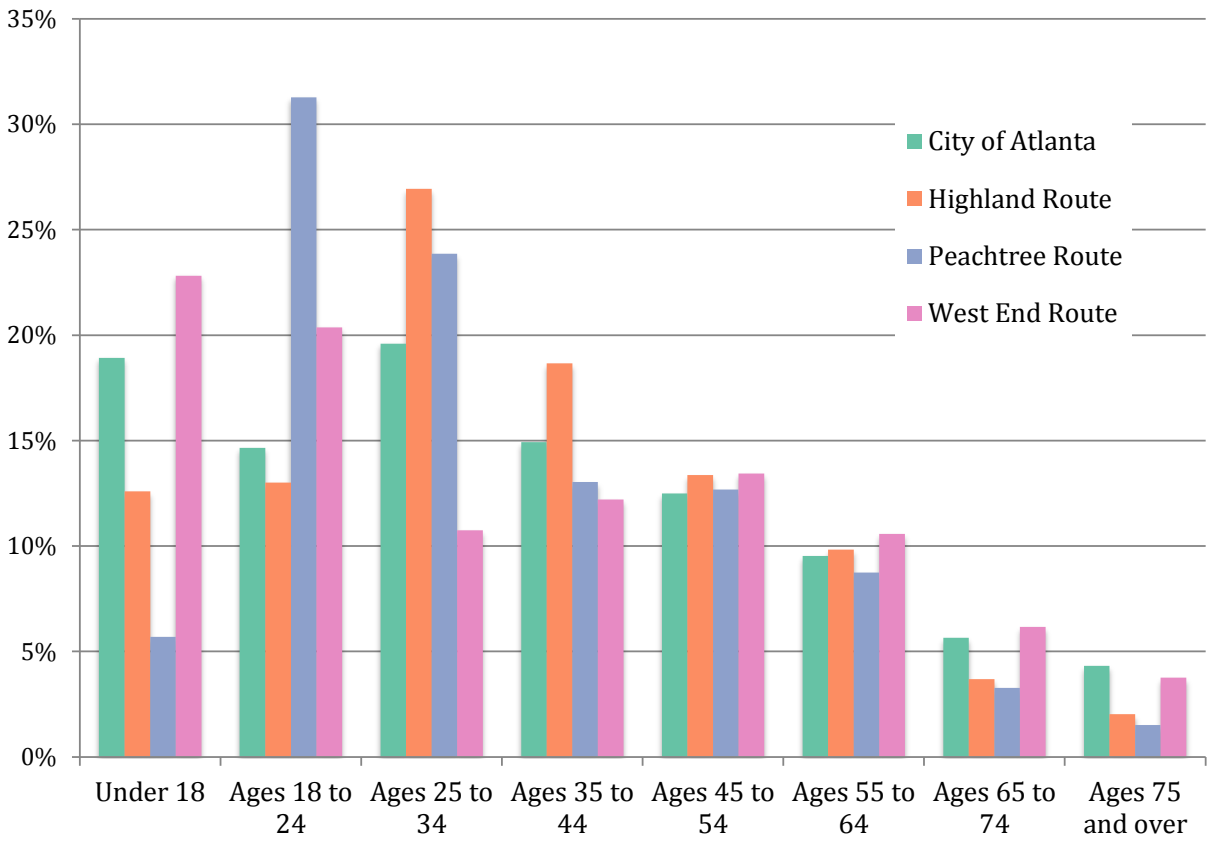


Figure 18. Age Distribution of Residents Surrounding ASA 2014 Event Routes



Demographic Characteristics and Socioeconomic Status of Atlanta Streets Alive Attendees

As discussed in the section Attendance Counts and Residential Locations, Atlanta Streets Alive attendees hail from throughout the Atlanta region. Accordingly, the demographic characteristics and SES of people at the event are not necessarily representative of the nearby residential population. Intercept surveys conducted during past Atlanta Streets Alive events asked attendees to provide their gender, age, race, education level, and household income. The following tables compare the survey responses to the U.S. census data presented in the above section.

Table 5. Comparison of Demographic and Socioeconomic Factors Along Atlanta Streets Alive 2013 Highland Route and Surveyed Event Attendees

	Surveyed Attendees (n = 49)	Census Tracts
Gender		
Percent Female	61.2%	48.9%
Percent Male	38.8%	51.1%
*Race & Ethnicity**		
White	87.8%	70.4%
Black or African American	6.1%	22.0%
American Indian or Alaskan Native	0.0%	0.1%
Pacific Islander[1]	2.0%	4.2%
Asian		
Latino	4.1%	5.1%
Other[2]	0.0%	2.3%
Education Level		
High School	4.1%	14.4%
Some College	12.2%	24.5%
Bachelor's or above	83.7%	61.2%
Household Income		
$50,000 or less	37.5%	Median=$65,341 Mean=$97,854
$51,000-$99,000	29.2%	
$100,000 or more	33.3%	

*The survey included Latino as a selection together with the other races listed. However, the U.S. Census asks individuals to specify a race and Hispanic/Latino ethnicity separately. Accordingly, Latino individuals are counted twice in the census data presented in this table.

1. U.S. Census includes "Native Hawaiin" in this category.
2. Other or "two or more races" indicated in the U.S. Census.

As shown in Table 5, more females were surveyed than males at the Highland ASA 2013 event, whereas the ratio of female to male residents surrounding the route is approximately one-to-one. However, the more notable differences between 2013 Highland ASA attendees surveyed and residents surrounding the route were for race and education levels. Approximately 88% of survey respondents were white compared to 70.4% of residents, and, conversely, only 6% of survey respondents were black or African American compared to 22% of residents. Attendees surveyed were more highly educated than residents of the area – approximately 84% of respondents had a bachelor's degree or higher compared to 61% of residents with a bachelor's or above, 24.5% with some college, and 14.4% with only high school.

Table 6. Comparison of Demographic and Socioeconomic Factors Along Atlanta Streets Alive 2014 West End Route and Surveyed Event Attendees[8]

	Surveyed Attendees (n = 78)	Census Tracts
Gender		
Percent Female	61.7%	57.7%
Percent Male	38.3%	42.3%
*Age**		
Average Age	35.5	33.6
Median Age	34.0	
*Race & Ethnicity***		
White	38.8%	7.3%
Black or African American	40.3%	88.8%
American Indian or Alaskan Native	0.0%	0.1%
Pacific Islander[1]	1.5%	0.0%
Asian	6.0%	1.1%
Latino	7.5%	1.9%
Other[2]	6.0%	2.4%
Education Level		
High School	11.1%	50.9%
Some College	25.0%	34.4%
Bachelor's or above	63.9%	14.7%

*Age for the census tracts is the average of the median ages for all census tracts within 1/4 mile of the route.
**The survey included Latino as a selection together with the other races listed. However, the U.S. Census asks individuals to specify a race and Hispanic/Latino ethnicity separately. Accordingly, Latino individuals are counted twice in the census data presented in this table.
1. U.S. Census includes "Native Hawaiin" in this category.
2. Other or "two or more races" indicated in the U.S. Census.

As shown in Table 6, the gender and ages of the 2014 West End ASA attendees surveyed were representative of the census tracts surrounding the event, but the race and education levels of survey respondents were very different from nearby residents. The education level trends are the inverse of each other – the majority of surveyed attendees had a bachelor's degree or above compared to 50.9% of residents with only a high school education. In addition, the large majority of residents surrounding the ASA West End route are black or African American (89%), but only 40% of attendees surveyed were black or African American. The race with the second most surveyed individuals is white (39% of

[8] Survey responses for the household income question are not available for analysis.

surveyed attendees compared to only 7% of residents). In addition, the number of respondents that indicated Asian, Latino, and Other were 5.4, 4, and 2.5 times higher than the proportion of residents of those races/ethnicities, respectively.

Table 7. Comparison of Demographic and Socioeconomic Factors Along Atlanta Streets Alive 2014 Peachtree Street Route and Surveyed Event Attendees

	Surveyed Attendees (n = 20)	Census Tracts
Gender		
Percent Female	35%	41%
Percent Male	65%	59%
*Age**		
Average Age	40.1	31.4
Median Age	33	
*Race & Ethnicity***		
White	55%	53.4%
Black or African American	20%	32.0%
American Indian or Alaskan Native	0%	0.5%
Pacific Islander[1]	0%	0.1%
Asian	10%	10.9%
Latino	10%	4.7%
Other[2]	5%	2.4%
Education Level		
High School	0%	16.5%
Some College	15%	37.6%
Bachelor's or above	85%	45.9%

*Age for the census tracts is the average of the median ages for all census tracts within 1/4 mile of the route.
**The survey included Latino as a selection together with the other races listed. However, the U.S. Census asks individuals to specify a race and Hispanic/Latino ethnicity separately. Accordingly, Latino individuals are counted twice in the census data presented in this table.
1. U.S. Census includes "Native Hawaiin" in this category.
2. Other or "two or more races" indicated in the U.S. Census.

As shown in Table 7, attendees surveyed at the ASA on Peachtree in May 2014 were mostly representative of the residents living in census tracts within one-quarter mile of the event, with the exception of education levels. All of the Peachtree ASA attendees surveyed had more than a high school degree, and the large majority (85%) had a bachelor's degree or higher, whereas less than 50% of residents in the surrounding census tracts have a

bachelor's degree or higher, 37.6% have some college education, and 16.5% only have a high school education.

Note that the survey for the 2014 Peachtree ASA included a question related to household income; however, the survey question and results provided for analysis do not indicate the income values that correspond to the numeric survey responses. If the response options of 1, 2, and 3 are ranked from low to higher incomes, then 11% of respondents were in the lowest income range, 42% in the middle range, and 47% in the highest income range. As shown in Table 7, the median household income of the census tracts surrounding the Peachtree ASA route is approximately $52,000 (which is higher than for Atlanta as a whole), and the mean income of approximately $76,500 is higher than the median.

Atlanta Health Disparities Analysis

Not unlike national trends, poor health indicators are concentrated among minority groups and individuals with lower SES within the City of Atlanta. The Neighborhood Quality of Life and Health (NQOLH) Project at the Center for GIS within the College of Architecture at Georgia Tech has compiled available health and quality of life data for the city of Atlanta at the Neighborhood Planning Unit (NPU) level.[9] Data for Atlanta NPUs compiled by the NQOLH Project team includes information related to food access, walkability/physical activity, mortality, and morbidity (Atlanta's Neighborhood Quality of Life & Health Project 2015).

Figure 19 presents the health index for each Atlanta NPU ranging from 1 (high) to 25 (low) based on the combination of the four health indicators of nutrition, physical activity, mortality, and morbidity, and Figure 20 presents the physical activity ranking for each NPU from high (1) to low (25).[10] The physical activity rankings are based on data from Walk Score, which is used by the NQOLH Project as a proxy for physical activity of residents due to the absence of useful self-reported data at the NPU scale
(Atlanta's Neighborhood Quality of Life & Health Project 2015).
Mortality and morbidity data are from the Georgia Department of Public Health, and food access is calculated based on data from the U.S. Census Bureau for no vehicle households living farther than 0.9 miles from a supermarket.

Figure 21 and Figure 22 display the African American residential population density by census tract and the percentage of individuals living below the poverty level by census tract, respectively. The data are per the U.S. Census Bureau American Community Survey for the five-year period of 2009-2013.

[9] Note obesity, physical activity rates, and other health data based on individuals are not publically available at a smaller scale than the county-level due to privacy concerns. Accordingly, the NQOLH Project information compiled for the City of Atlanta was consulted as a proxy to assess health in the City of Atlanta.
[10] Refer to the NQOLH Project website for detailed information on the health index calculations and data sources: http://www.cgis.gatech.edu/NQOLH/NH_Index/

Figure 19. Atlanta Neighborhood Planning Units Health Indices

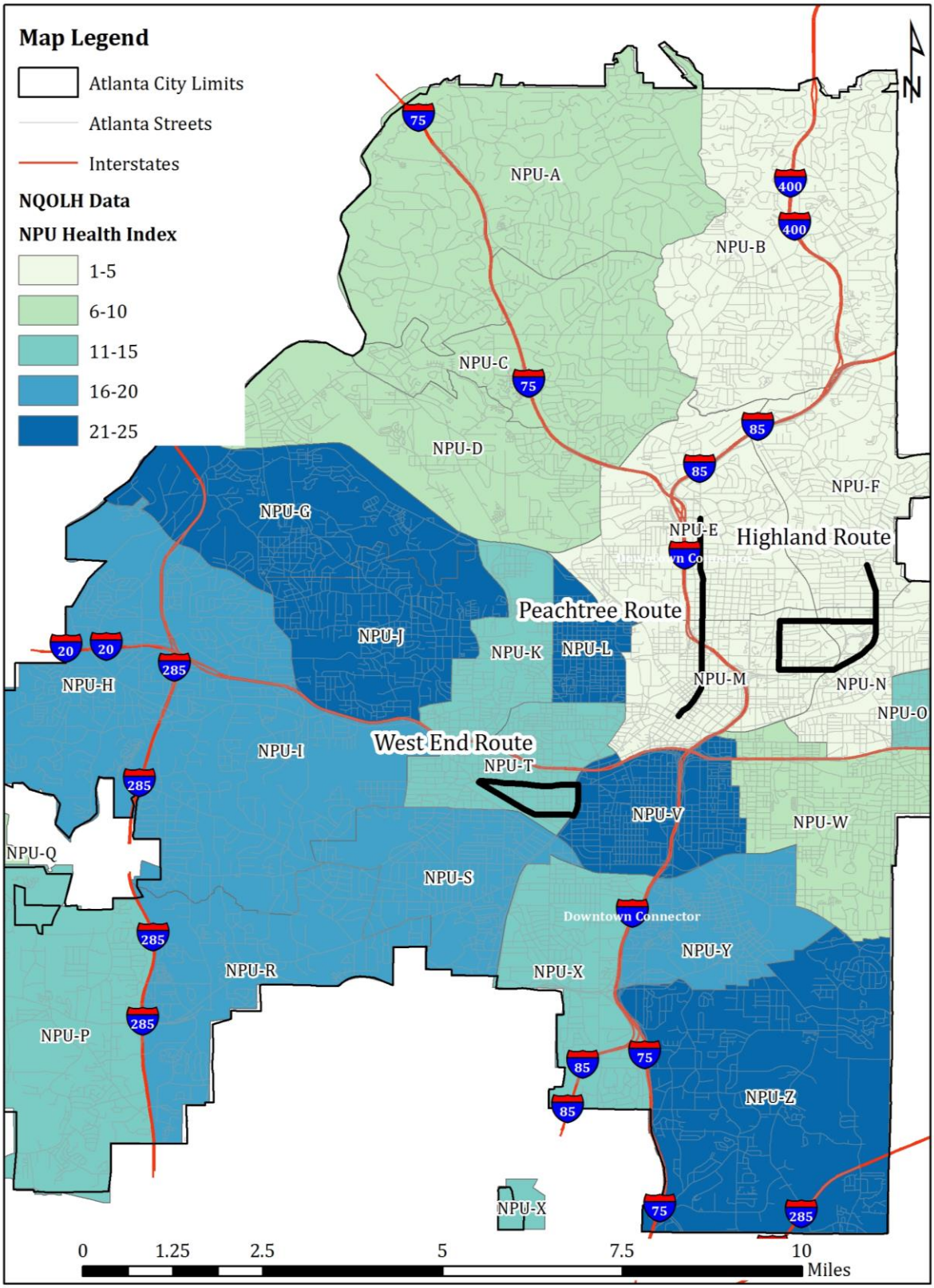
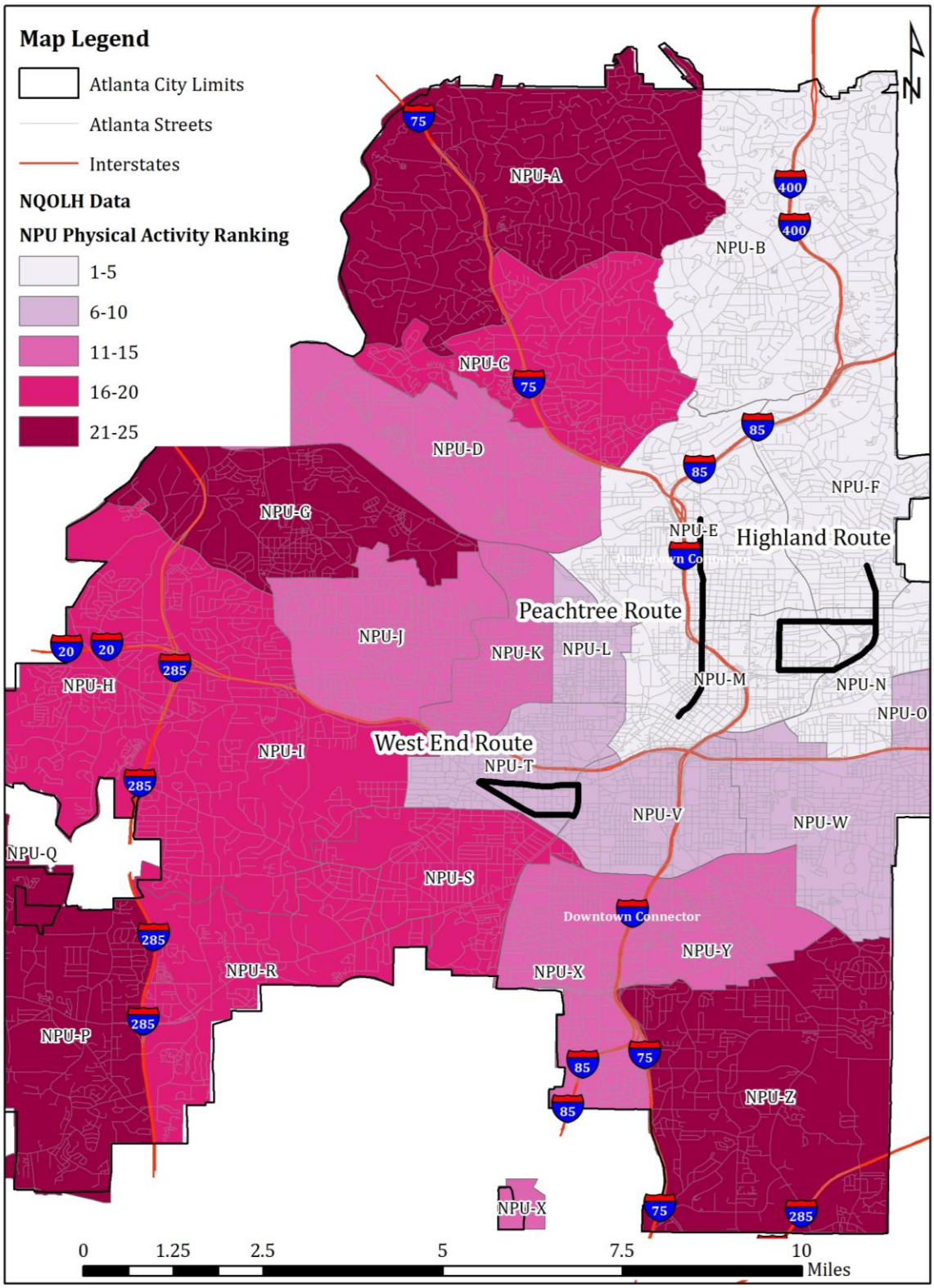


Figure 20. Atlanta Neighborhood Planning Units Physical Activity Ranking[11]



[11] Based on Walk Score data.

Figure 21. Atlanta African American Population Density by Census Tract

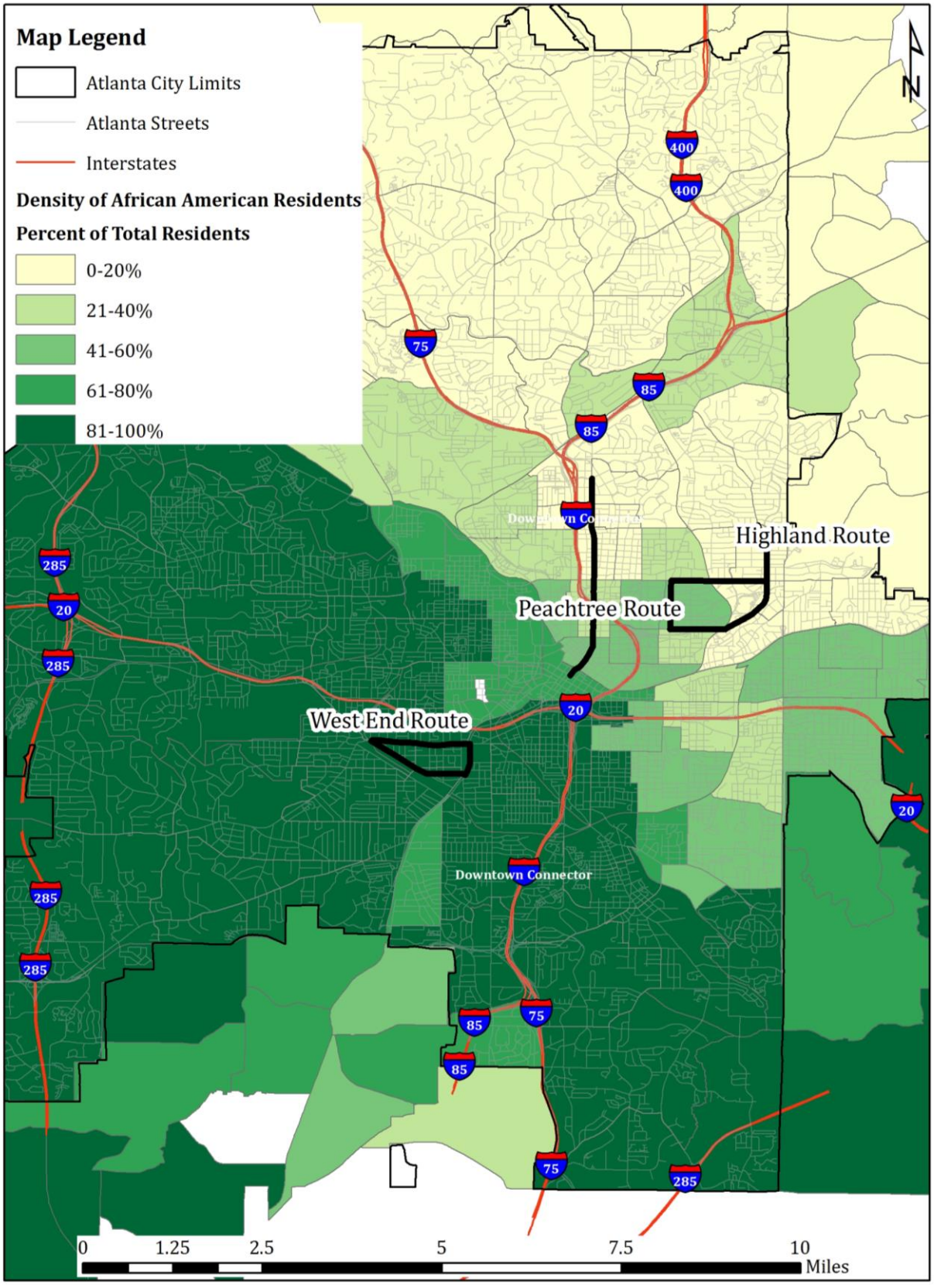
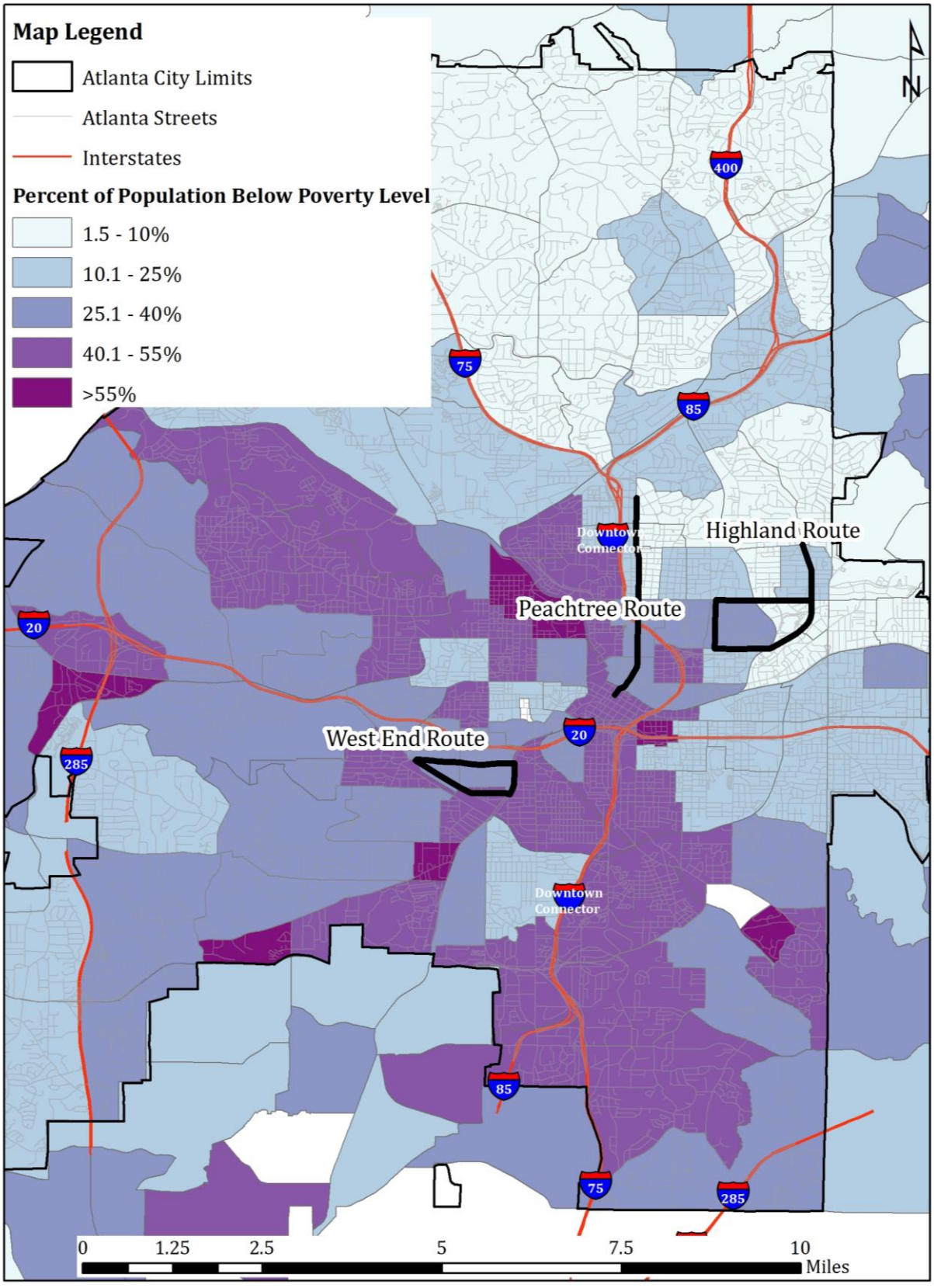


Figure 22. Atlanta Percent of Population Living Below Poverty Level by Census Tract



As shown in Figure 19, Figure 20, Figure 21, and Figure 22, areas with lower health indices, physical activity rankings, higher proportions of African Americans, and higher percentages of individuals living below the poverty line are clustered near to each other. Furthermore, the areas of Atlanta with higher proportions of minority individuals and higher percentages of individuals living below the poverty line generally align with the locations of the NPUs with lower health indices and physical activity rankings. This supports the need for considering the social determinants of health and including these populations in health interventions such as Atlanta Streets Alive.

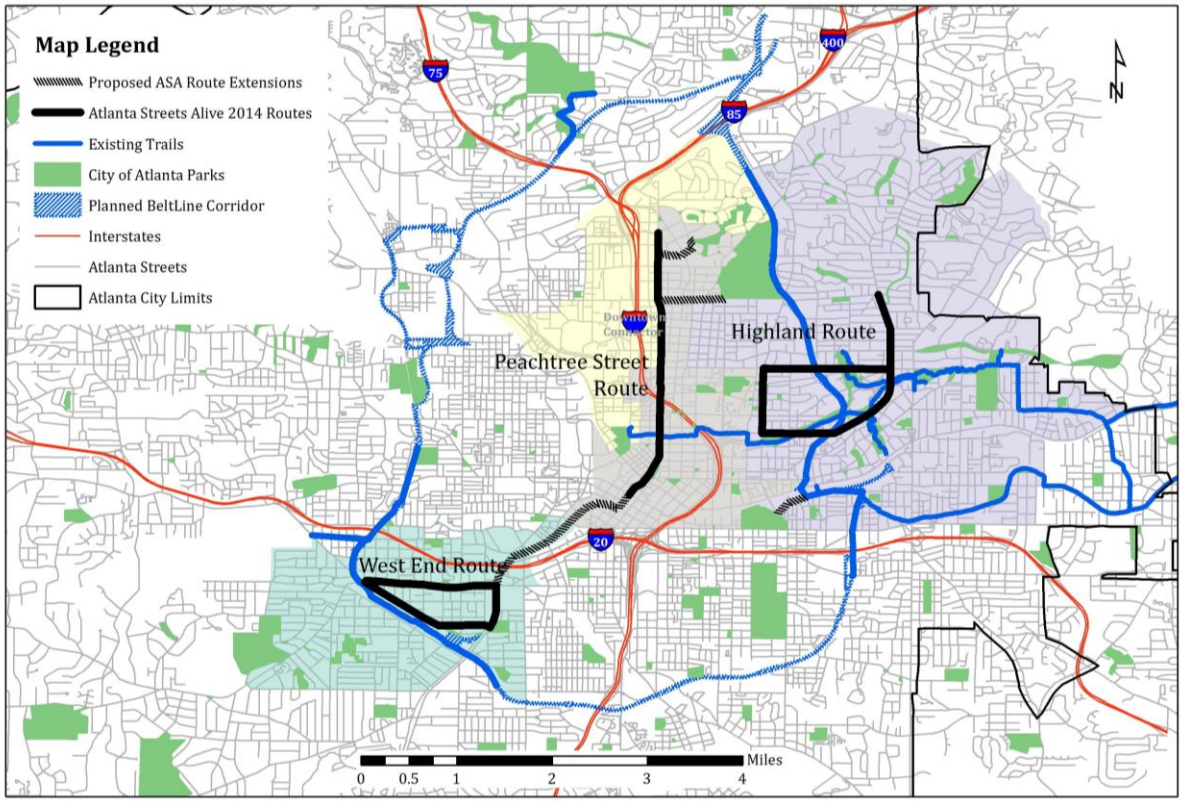
As shown in Figure 19, the NPUs around the Peachtree and Highland routes are all in the top five highest health indices. However, areas just to the south and west of the Peachtree route are in the bottom five of all Atlanta NPUs, and these two NPUs are also in close proximity to the West End route. The NPUs surrounding the West End route have health indices ranking from the mid-range to the lowest. Notably, NPU-V (the NPU that is intersected by the downtown connector and Interstate 20) has a health index ranking of 21 out of 25 Atlanta NPUs. NPU-L, located to the west of the Peachtree route and north of the West End route, is ranked 22 out of 25. There is clear potential for the existing ASA routes to improve the health outcomes of the residents of these NPUs due to their proximity.

As shown in Figure 20, the NPUs around the Peachtree and Highland routes have the highest physical activity rankings. The NPUs immediately around the West End route are ranked in the top 10 of 25 NPUs for physical activity, but the route is bordered by NPUs in the lower half of the physical activity rankings. Furthermore, the five NPUs with the lowest physical activity rankings (21-25) are located around the edges of the City of Atlanta and not close to any of the three existing ASA routes.

Potential for the Future

The existing Atlanta Streets Alive event routes are located nearby several existing multiuse trails and existing parks that could potentially connect to the routes and even connect multiple ASA routes to each other. Figure 23 displays these trails and parks in relation to the current three Atlanta Streets Alive event routes.

Figure 23. Parks and Trails in Atlanta and Proposed ASA Route Extensions



As shown in Figure 23, the Peachtree and Highland routes are already connected by a PATH Foundation trail, which continues east of the Highland route. There are also clear, existing connections to the West End and Highland routes using the Atlanta BeltLine; however, these routes are not direct as the crow flies but rather fairly indirect. Connecting the West End route to the Atlanta BeltLine would enable residents living north of Interstate 20 and west of the downtown connector to attend an ASA event without needing to bike or walk along a busy road or drive a vehicle.

Summary

Study Limitations

The research on health and social equity in Atlanta Streets Alive events is limited by the availability health-related data at a scale smaller than the county level. In particular, health statistics specific to the population in a given census tract are not available because of privacy restrictions. As such, health indicators were used to approximate the health status of residents in Atlanta by neighborhood planning unit. In addition, mapping data of certain social determinants of health, including poverty status, and for those populations that experience higher rates of obesity and physical inactivity at the national-level (African Americans were used in Atlanta given that they comprise a high percentage of the total Atlanta population compared to Hispanics and other minority groups) was used to reveal trends in these factors as they relate to the Atlanta Streets Alive routes.

Additionally, this analysis is limited by the survey information gathered from past Atlanta Streets Alive participants. The total number of individuals surveyed at each event was small compared to the total estimated number of attendees as discussed in the above sections. Based on survey design methods published by Dillman, for population sizes 100,000 and over, 383 people should be surveyed to have 95% confidence that the sample is representative of the population (Dillman, Smyth, and Christian 2014). Thus, it is not possible to ascertain whether the survey sample was representative of all event attendees.

Recommendations

The analysis of Atlanta Streets Alive revealed several recommendations specific to ASA. While the below recommendations are specific to enhancing equitable access to Atlanta Streets Alive, they may apply to many open streets initiatives across the U.S. as well as internationally.

Connect and Expand Routes

Atlanta Streets Alive routes should be connected to existing multiuse paths and bicycle lanes as well as to convenient public transportation. In addition, the routes should extend into more parts of Atlanta as is feasible to provide access to more individuals. Previous studies and surveys have indicated that the majority of the population prefers paths and trails separated from vehicular traffic for walking and biking. As such, if routes can't be connected or extended by closing more of the street network to vehicles, priority should be given to trails and/or paths separated from vehicular traffic, followed by low-traffic roads. Connections to parks may also encourage individuals to recreate and exercise beyond the duration of the event.

Establish and Foster Additional Partnerships

More partners in the community are vital. These partnerships could take on the form of more money or volunteer support to sponsor more frequent ASA events, more activities along the route, etc. Alternatively, relationships could be formed with community organizations in the surrounding neighborhoods such as churches, schools, and senior

centers. These organizations can help raise awareness of Atlanta Streets Alive to their members and encourage participation in the events. Additionally, members of these organizations could partner with ASA event organizers to plan upcoming event activities, routes, vendors, etc.

The city and county may also act as partners for ASA events. In particular, municipality staff should be consulted to see if there are any temporary pop-ups or installations they would like to construct as part of an open streets event to educate the public or gain feedback about potential changes to the built environment that could potentially result in lasting change. Examples include a two-way cycletrack (i.e., separated two-way bike lanes), bike box, a high-intensity activated crosswalk beacon (AKA HAWK signal), and new signage.

Create a Standardized Event Survey and Surveying Protocol

Establishing a standardized intercept surveying protocol and questionnaire for Atlanta Streets Alive would allow for improved event evaluation. The survey questions should ask basic demographic and SES information of attendees and may also include questions related to the attendees' feelings about the event, participation in activities along the route, transportation mode to the event, and solicitation of businesses along the route. Following each event, ASA organizers should compile the survey responses and analyze the demographic and SES of event attendees and compare this information to the Atlanta population. With this data, event organizers can track what subpopulations are not attending ASA and develop targeted initiatives to reach people not attending the events. Collaboration with these groups may allow for event organizers to determine potential changes that would attract these groups to ASA. Overall, surveying and evaluation are key components to establishing benchmarks and tracking progress towards reaching goals.

Sample surveys and protocols are included in Appendix B of this report. In addition, a suggested survey template and protocol for use at upcoming Atlanta Streets Alive events is included in Appendix B.

Next Steps for Research

The research on the impacts of open streets events in general and this paper's assessment specific to Atlanta Streets Alive illuminate the breadth of additional research questions that may be appropriate for a wide variety of disciplines to investigate. In particular, ideas to explore that build on this research include the following:

- What is the appropriate dosage AND environment for implementing public health interventions aimed at increasing physical activity levels of both adults and youth? How might open streets events fit into this?
- What routes maximize access to Atlanta Streets Alive for the most Atlanta residents given existing trails and infrastructure?
- How effective are temporary pop-ups at influencing individuals, businesses, and/or municipalities to change their behavior and/or infrastructure AFTER the pop-up is removed (whether it be a multiday festival or four-hour open streets event)?

Conclusions

The benefits of open streets events have been demonstrated throughout the U.S. and abroad. Atlanta Streets Alive events are moving in a positive direction to include a broader range of the city's population and have the potential to connect even more areas of Atlanta by linking routes to existing multiuse trails in the city. Atlanta Streets Alive events are great places to demonstrate and experiment with changes to the built environment, such as protected bike lanes in place of a vehicle travel lane or a protected bus shelter at a popular stop, using temporary installations. By creating greater accessibility to the routes using an active mode of transportation as well as through encouraging attendance by all individuals, a greater percentage of Atlanta's citizens can enjoy the myriad health and social benefits of open streets events, and organizers, activity coordinators, and city employees can educate a broader audience about whatever it is they are hoping to promote (e.g., protected bicycle lane, dance class, healthy eating habits, etc.).

Appendix A. References

Alive, Atlanta Streets. 2015. "About." Accessed February 11, 2015. http://www.atlantastreetsalive.com/about-2/.

America Walks. 2015. "About Us." Accessed April 4, 2015. americawalks.org/about-us.

Atlanta Streets Alive. 2015a. "Activity Partner Instructions." Accessed March 10, 2015. http://www.atlantastreetsalive.com/activity-partner-instructions/.

Atlanta Streets Alive. 2015b. "Become an Activity Partner." Accessed March 10, 2015. http://www.atlantastreetsalive.com/activity-partners/.

Atlanta's Neighborhood Quality of Life & Health Project. 2015. "Data & Methods: NH Index." Accessed March 13, 2015. http://www.cgis.gatech.edu/NQOLH/NH_Index/.

Barnes, Patricia M., and Charlotte A. Schoenborn. 2012. Trends in Adults Receiving a Recommendation for Exercise or Other Physical Activity From a Physician or Other Health Professional In *NCHS Data Brief*. Hyattsville, MD: National Center for Health Statistics.

Behavioral Research Unit. 2002. Behavior Change - A Summary of Four Major Theories. edited by Family Health International (FHI).

Brown, Charles, and Heather Martin. 2013. Evaluation Report: The New Brunswick Ciclovia 2013. Alan M. Voorhees Transportation Center, Edward J. Bloustein School of Planning and Public Policy, Rutgers, The State University of New Jersey.

C40 Cities. 2011. "Case Study: Bogotá's CicloRuta is One of the Most Comprehensive Cycling Systems in the World." Accessed April 13, 2015. http://www.c40.org/case_studies/bogot%C3%A1%E2%80%99s-cicloruta-is-one-of-the-most-comprehensive-cycling-systems-in-the-world.

Champion, Victoria L., and Celette Sugg Skinner. 2008. "The Health Belief Model." In *Health Behavior and Health Education: Theory, Research, and Practice*, edited by Karen Glanz, Barbara K. Rimer and K. Viswanath, 45-65. San Francisco: Jossey-Bass.

DeShazo, J.R, Colleen Callahan, Madeline Brozen, and Benton Heimsath. 2013. Economic Impacts of CicLAvia: Study Finds Gains to Local Businesses (Briefing Paper). edited by UCLA Luskin School of Public Affairs - Los Angeles Sustainability Collaborative.

Dillman, Don A., Jolene D. Smyth, and Leah Melani Christian. 2014. *Internet, Phone, Mail, and Mixed-Mode Surveys: The Tailored Design Method*. 4 ed: John Wiley & Sons.

Eyler, Amy A., J. Aaron Hipp, and Julie Lokuta. 2014. "Moving the Barricades to Physical Activity: A Qualitative Analysis of Open Streets Initiatives Across the United States." *American Journal of Health Promotion*. doi: http://dx.doi.org/10.4278/ajhp.131212-QUAL-633.

Fakhouri, Tala H.I., Jeffery P. Hughes, Vicki L. Burt, MinKyoung Song, Janet E. Fulton, and Cynthia L. Ogden. 2014. Physical Activity in U.S. Youth Aged 12–15 Years, 2012. In *NCHS Data Brief*. Hyattsville, MD: National Center for Health Statistics.

Fogelholm, M. 2009. "Physical activity, fitness and fatness: relations to mortality, morbidity and disease risk factors. A systematic review." *Obesity Reviews: an official journal of the International Association for the Study of Obesity* 11:202-221. doi: 10.1111/j.1467-789X.2009.00653.x.

Hipp, J. Aaron, Amy A. Eyler, and Jill A. Kuhlberg. 2012. "Target Population Involvement in Urban Ciclovias: A Preliminary Evaluation of St. Louis Open Streets." *Journal of*

Urban Health of the New York Academy of Medicine 90 (6). doi: 10.1007/s11524-012-9759-6.

Hipp, J. Aaron, Amy A. Eyler, Susan G. Zieff, and Michael A. Samuelson. 2014. "Taking Physical Activity to the Streets: The Popularity of Ciclovia and Open Streets Initiatives in the United States." *American Journal of Health Promotion* 28 (3 Supplement):S114-S115.

John Pucher, PhD, PhD Ralph Buehler, PhD David R. Bassett, and MD Andrew L. Dannenberg, MPH. 2010. "Walking and Cycling to Health: A Comparative Analysis of City, State, and International Data." *American Journal of Public Health* 100 (10).

Kauffman, Rachel. 2014. Unsurprisingly, The Wealth Gap Equals the Health Gap. *Urbanful*. Accessed September 12, 2014.

Kuhlberg, J.A., J. Aaron Hipp, Amy A. Eyler, and G. Chang. 2014. "Open Streets Initiatives in the U.S.: Closed to Traffic, Open to Physical Activity." *American Journal of Health Promotion*.

Levine, James A. 2011. "Poverty and Obesity in the U.S." *Diabetes* 60 (11). doi: 10.2337/db11-1118.

Lopez, Russel P., and H. Patricia Hynes. 2006. "Obesity, physical activity, and the urban environment: public health research needs." *Environmental Health* 5 (25). doi: 10.1186/1476069X525.

McAlister, Alfred L., Cheryl L. Perry, and Guy S. Parcel. 2008. "How Individuals, Environments, and Health Behaviors Interact: Social Cognitive Theory." In *Health Behavior and Health Education: Theory, Research, and Practice*, edited by Karen Glanz, Barbara K. Rimer and K. Viswanath, 169-188. San Francisco: Jossey-Bass.

Montano, Daniel E., and Danuta Kasprzyk. 2008. "Theory of Reasoned Action, Theory of Planned Behavior, and the Integrated Behavioral Model." In *Health Behavior and Health Education: Theory, Research, and Practice*, edited by Karen Glanz, Barbara K. Rimer and K. Viswanath, 68-96. San Francisco: Jossey-Bass.

Montes, Felipe, Olga L. Sarmiento, Roberto Zarama, Michael Pratt, Guijing Wang, Enrique Jacoby, Thomas L. Schmid, Mauricio Ramos, Oscar Ruiz, Olga Vargas, Gabriel Michel, Susan G. Zieff, Juan Alejandro Valdivia, Nick Cavill, and Sonja Kahlmeier. 2012. "Do Health Benefits Outweigh the Costs of Mass Recreational Programs? An Economic Analysis of Four Ciclovía Programs." *Journal of Urban Health of the New York Academy of Medicine* 89 (1):153–170. doi: 10.1007/s11524-011-9628-8.

Neighborhood Planning Unit M. 2012. "Title." *The Oppidan Omnibus*. http://oppidanomnibus.com/2012/03/.

Office of Disease Prevention and Health Promotion. 2015a. "Be Active Your Way: A Fact Sheet for Adults." Accessed March 19, 2015. http://www.health.gov/paguidelines/factSheetAdults.aspx.

Office of Disease Prevention and Health Promotion. 2015b. "Physical Activity." Accessed March 4, 2015. https://http://www.healthypeople.gov/2020/topics-objectives/topic/physical-activity/objectives.

Office of Disease Prevention and Health Promotion. 2015c. "Social Determinants of Health." Accessed April 14, 2015. http://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health.

Ogden, Cynthia L., Margaret D. Carroll, Brian K. Kit, and Katherine M. Flegal. 2012. Prevalence of Obesity in the United States, 2009–2010. In *NCHS Data Brief*, edited by

National Center for Health Statistics. Hyattsville, MD: National Center for Health Statistics.

Ogden, Cynthia L., Molly M. Lamb, Margaret D. Carroll, and Katherine M. Flegal. 2010. Obesity and Socioeconomic Status in Adults: United States, 2005–2008. In *NCHS Data Brief*, edited by National Center for Health Statistics. Hyattsville, MD: National Center for Health Statistics.

Ogden, Cynthia L., Margaret D. Carroll, Brian K. Kit, and Katherine M. Flegal. 2013. Prevalence of Obesity Among Adults: United States,

2011–2012. In *NCHS Data Brief*, edited by National Center for Health Statistics. Hyattsville, MD: National Center for Health Statistics.

President's Council on Fitness, Sports, & Nutrition. 2015. "Participate in Programs: Let's Move!" Accessed April 1, 2015. http://www.fitness.gov/participate-in-programs/lets-move/.

Sarmiento, Olga L., Andrea Torres, Enrique Jacoby, Michael Pratt, Thomas L. Schmid, and G. Stierling. 2010. "The Ciclovia-Recreativa: A Mass-Recreational Program with Public Health Potential." *Journal of Physical Activity & Health* 7 (2).

Schneider, Margaret. 2011. "Behavioral Choices and the Built Environment." In *Making Healthy Places*, edited by Andrew L. Dannenberg, Howard Frumkin and Richard J. Jackson, 261-270. Washington, DC: Island Press.

Schwarzer, R. 2008. "Modeling Health Behavior Change: How to Predict and Modify the Adoption and Maintenance of Health Behaviors." *Applied Psychology: An International Review* 57 (1):1-29. doi: 10.1111/j.1464-0597.2007.00325.x.

Torres, Andrea, Olga L. Sarmiento, Christine Stauber, and Roberto Zarama. 2013. "The Ciclovia and Cicloruta Programs: Promising Interventions to Promote Physical Activity and Social Capital in Bogota, Colombia." *American Journal of Public Health* 103 (2). doi: 10.2105/AJPH.2012.301142.

Zieff, Susan, and Anoshua Chaudhuri. 2013. "Title." Social Sciences Research Network Working Paper Series, Rochester.

Appendix B. Sample Surveys and Surveying Protocols

The first two pages of this Appendix present a sample survey to administer at future Atlanta Streets Alive events. Note that this survey is meant to be quick and simple for participants to fill out and is based on questions asked during historical ASA events. If event organizers would like to assess additional elements of ASA, the survey can be added to or modified accordingly. Alternatively, other questions could be asked via intercept interviews administered during the event by event organizers and/or volunteers. For example, if the economic benefits are being analyzed, the following questions could be added:

- Did you learn of a new business during Atlanta Streets Alive today?
- How many businesses did you enter or engage with along the ASA route today?
- How much money did you (or do you) plan to spend during Atlanta Streets Alive?

Sample observation checklists, surveys, and protocols from *Open Streets Initiatives: Measuring Success* toolkit by J. Aaron Hipp, PhD and Amy Eyler, PhD, CHES, from Active Living Research are provided following the sample ASA survey.

Atlanta Streets Alive Participant Survey

1) How did you find out about Atlanta Streets Alive today? Check all that apply.

- ☐ Family/Friends
- ☐ Word of Mouth
- ☐ Posted Advertisement/Flier
- ☐ Newspaper
- ☐ Website
- ☐ Facebook
- ☐ Twitter
- ☐ Other (specify) _____

2) How did you get to Atlanta Streets Alive today?

- ☐ Walk/run
- ☐ Bike
- ☐ Other (specify) _____
- ☐ Automobile
- ☐ Public Transportation (bus, train, trolley)

3) Is this how you normally get around Atlanta?

- ☐ Yes
- ☐ No

4) How many days per week do you use a mode of transportation other than an automobile?

☐

5) How many Atlanta Streets Alive events have you been to **including** today?

- ☐ 1
- ☐ 2 - 3
- ☐ 4 - 6
- ☐ >6

6) How long do you plan to stay at Atlanta Streets Alive today?

- ☐ < 30 minutes
- ☐ 30 minutes - <1 hour
- ☐ 1 hour - <2 hours
- ☐ > 2 hours

7) How many days per week do you exercise during your leisure time?

☐

8) Does Atlanta Streets Alive change your feelings about the city?

- ☐ Yes, positively
- ☐ Yes, negatively
- ☐ No change

Comments _____

9) Do you think that Atlanta Streets Alive is welcoming to everyone?

- ☐ Yes, agree
- ☐ Neutral
- ☐ No, disagree

Comments _____

SAMPLE

Atlanta Streets Alive Participant Survey

10) Do you engage with people during Atlanta Streets Alive that you would not normally?

- ☐ Yes
- ☐ Sometimes
- ☐ No

Comments _____

11) What is your gender?

- ☐ Female
- ☐ Male

12) What is your age?

☐

13) What is the highest level of education you have received?

- ☐ Less than high school
- ☐ High school diploma or GED
- ☐ Some college or associate's degree
- ☐ College graduate
- ☐ Higher than undergraduate college

14) What is your combined annual household income?

- ☐ < $25,000
- ☐ $25,000 - $49,999
- ☐ $50,000 - $74,999
- ☐ $75,000 - $99,999
- ☐ $100,000 - $124,000
- ☐ > $125,000

15) How many people live in your household **including** yourself?

☐

16) What is your race?

- ☐ White
- ☐ Black or African American
- ☐ Asian
- ☐ American Indian or Alaskan Native
- ☐ Pacific Islander
- ☐ Two or more races
- ☐ Other (specify) _____

17) What is your ethnicity?

- ☐ Hispanic/Latino
- ☐ non-Hispanic/non-Latino

18) What is your zip code?

☐

THANK YOU FOR TAKING THIS SURVEY!!

Participant Count

What does it measure?

Count and estimate participants, their demographics (gender, adult or child, race), and their primary Open Streets activity during the initiative.

Why measure it?

An accurate participant count captures the impact of the Open Streets initiative and how participants are distributed throughout the event. The tool can be used to make comparisons with other initiatives and programs within the same city or other cities with similar programming. Furthermore, a participant count can be used to advocate the impact and reach of Open Streets. Along with a proper cost-benefit analysis, it can also drive strategy during the organization process of future events. For example, by learning the proportion of children and adults during Open Streets, organizers can plan different Activity Hubs and activities that are more attractive to match city demographics.

How do I measure it?

Supplies needed:

- ☑ Participant Count Observation Pathway to Measurement Tool
- ☑ Pencils
- ☑ Clipboards
- ☑ Watch
- ☑ Spreadsheet

Participants at the Ferguson, Missouri, Sunday Parkways event in June 2013.

Participant Count

Steps on the Measurement Pathway:

Step 1: Select the observation points. The number and location of observation points will depend on the number of volunteers and staff members as well as the distance of Open Streets. Two observers per observation point are necessary for this Participant Count tool. Therefore, the number of observation points will be half of the number of available observers. To determine the location of the observation points, divide the route length of the Open Streets event by half of the number of observers available for this tool. Then, distribute two observers to observation points with the calculated distance (using Google Maps) in between each team.

Step 2: Define the observation time period. Three, 15-minute observation periods are recommended. It is also suggested that these observation time periods are an hour apart (i.e. 9:45 a.m. to 10:00 a.m., 10:45 a.m. to 11:00 a.m., and 11:45 a.m. to 12:00 p.m.).

Step 3: Conduct the participant count observations. The two observers at each observation point will count and record quantitative observations of different types of participants. Age, gender, and race are based on the observers' best approximation. Observers should also write the exact cross-streets on the tally sheet. During each time period, observers will record the following:

Observer #1: The number of adult (18+) participants by gender, who are walking, cycling, or skating. Race/ethnicity can be included as well, but this can be very difficult to determine on observation alone.

Observer #2: The number of child (<18) participants by gender, who are walking, cycling, skating, or being pushed. Race/ethnicity can be included as well, but this can be very difficult to determine on observation alone.

Observer #1 & 2: General qualitative observations about the participants including social groups (number of people in groups, combination of children/adults), the interaction among the different forms of activity (e.g. are cyclists staying on one side of the road, where are most pedestrians in relation to other active participants), are people carrying things (e.g. give-a-ways). Record of the environment including merchants, attractiveness, and presence/absence of sidewalks.

Participant Count

Step 4: Data input. Input the count data collected on Participant Count tally sheets into a spreadsheet following Open Streets. Adult and child counts, and observation points should be separated. An example Participant Count Spreadsheet is available on this website. It displays cell numbers and formulas.

Step 5: Data analysis: Summation of observed participant counts. Add up all of the observed participant counts on the spreadsheet using formulas. The spreadsheet formulas depend on the number of observation locations used.

Step 6: Putting it all together: Estimation of total participants. Multiply the number of participants observed by the speeds of activities using the formulas in the available Participant Count spreadsheet. The spreadsheet takes into account the distance between observation points and general speed of participant based on activity (cycling, walking, skating).

Please note: *These speeds and activities are based on Bogota's Ciclovía . We believe this underestimates total participation in most US Open Streets due to the presence of many Activity Hubs resulting in families walking shorter distances and instead participating in Activity Hubs.*

Surveyors at CicloSDias San Diego estimate their participants.

Participant Count

[9:15-9:30 am]	Adult Walkers Male	Adult Walkers Female	Adult Cyclists Male	Adult Cyclists Female	Adult Skaters Male	Adult Skaters Female	Adult Other Male	Adult Other Female
WHITE/ CAUCASIAN	||			𝍸		𝍸 |		
AFRICAN AMERICAN	𝍸 |	𝍸						
HISPANIC	|||		|					
ASIAN			𝍸					
OTHER/NOT ABLE TO DETERMINE		|||						

This example Participant Count Tally Sheet can be used to keep track of adult/child counts, participants' race/ethnicity and activities during Open Streets.


What is your home zipcode?
CicloSDias
SAN DIEGO
1 Take a sticker.
2 Place it in the area that matches your answer.


Hello!


OPEN STREETS

Observation Materials

The following example sheets will be used to record information.
Template forms are available on this website.

PARTICIPANT COUNT OBSERVATION PATHWAY TO MEASUREMENT TOOL

November 23, 2013, Downtown St. Louis Open Streets

Protocol:

Observations will take place at three points along the route. There will be 3 observation periods of 15 minutes each.

[Identify the 3 separate time periods. For example; 9:45-10:00, 10:45-11:00, 11:45-12:00]

The two observers per location will record:

Observer #1: The number of adult (18+) participants by gender, who are walking, cycling, or skating.

Observer #2: The number of child (<18) participants by gender, who are walking, cycling, skating, or being pushed/carried.

Observer #1 & 2: General observations about the participants including social groups (number of people in groups, combination of children/adults), the interaction among the different forms of activity (e.g. are cyclists staying on one side of the road, where are most pedestrians in relation to other active participants), are people carrying things (e.g. giveaways). Make a record of the environment including merchants, attractiveness, presence/absence of sidewalks.

Age and gender are your best approximation.

Be sure to write exact cross-street on the tally sheet.

Location #1: *Grand & 14th Street*

Location #2: *Directly across the street from Qdoba on the corner of 15th & Jefferson*

Location #3: *The four-way stop at Chouteau & 17th Street*

OBESERVER #1: Adults and Activity

Observer's Name: *Julie Nichols*

During the times listed, please tally the participants in the appropriate categories. Count people as they go by the line of sight directly in front of you. For example, stand on the south side of the street and pick a spot directly across from you on the north side of the street (fire hydrant, doorway, etc.) Make a tally mark for each person that crosses this imaginary line during the 15-minute time frame.

Observation Materials

Observation Location: *Grand & 14th street*

[9:15-9:30 am]	Walkers Male	Walkers Female	Cyclists Male	Cyclists Female	Skaters Male	Skaters Female	Other Male	Other Female
WHITE/ CAUCASIAN		𝍸					𝍸	
AFRICAN AMERICAN	𝍸							
HISPANIC				𝍸				
ASIAN					𝍸			
OTHER/NOT ABLE TO DETERMINE	𝍸		𝍸					

Repeat this same table for Time #2 and Time #3.

Observation Materials

Observer #2 Children (<18)

Observer's Name: *William Blatz*

During the times listed, please tally the participants in the appropriate categories. Count people as they go by the line of sight directly in front of you. For example, stand on the south side of the street and pick a spot directly across from you on the north side of the street (fire hydrant, doorway, etc.) Make a tally mark for each person that crosses this imaginary line during the 15-minute time frame.

Observation Location: *Across the street from Qdoba at 15th & Jefferson*

[11:45a-12:00p]	Walkers Male	Walkers Female	Cyclists Male	Cyclists Female	Skaters Male	Skaters Female	Strollers/ Carrried	Other
WHITE/ CAUCASIAN	𝍸					𝍸		
AFRICAN AMERICAN			𝍸					
HISPANIC		𝍸					𝍸	
ASIAN				𝍸				𝍸
OTHER/UNABLE TO DETERMINE								

Repeat this same table for Time #2 and Time #3.

Observation Materials

Observer #1 & #2 Qualitative Evaluations

Observer's Name: Julie Nichols

Observation Location: Grand & 14th street

Answer the following questions for each of the time periods for study.

Describe the overall environment in your viewscape including Activity Hubs, merchants, trees, benches, sidewalks, etc. For example: *Three open stores, two closed stores. Stores appear to have light traffic. Both sides of street tree-lined. Two benches on street, with person turnover every five minutes. Sidewalks are in good condition. The Activity Hub, hula hooping, has had a steady stream of participants. There are cars parked on street. The south side of street is shaded and the north is in sun. Most people keeping to the sunny-side.*

During the 45 minutes between direct observation times, please walk around and enjoy the Open Streets. As you do this, feel free to continue note-taking on an additional sheet of paper and please take digital photographs of the event. If you think of any items that should be measured in addition to the ones listed above, please suggest these here. Finally, if you are near an Activity Hub or a natural break in the Open Streets (intersection with through traffic) and have time to walk to this area please do so and note the interactions and numbers around these designated activities. We very much appreciate your participation and input into this evaluation.

Observation Time: [9:15-9:30 am]

Describe the groups of people in your line of sight. Are they traveling in groups? What is the make-up of these groups (college students, families, etc.)?	There are a couple of larger groups of college-aged women who are walking together. There was a small team of male bike riders and a group of elderly men walking as well.
How are people doing different types of activity interacting with one another (are there confrontations between bikers and walkers, accidents, near-misses)?	There was almost an accident between a guy on a pogo stick and someone rollerblading. The pogosticker jumped off quickly and the rollerblader swerved to avoid him.
Are cycling and skating participants wearing appropriate safety equipment?	Most people seem to be wearing helmets, but the group of female bikers did not have helmets on.

Observation Materials

Describe what people are carrying (grocery bags, water bottles, balls, chairs, picnic baskets, etc.).	*No one I saw was carrying anything other than iPods or water bottles.*
Estimate the racial composition during this 15 minutes (75% white, 20% African-American, 5% other)	*Around 30% were white, 20% were African-American, 15% were Hispanic, 10% Asian, and 25% other /unable to determine.*
Are people using the street for purposes other than travel? For example, throwing a Frisbee/ football, kicking a soccer ball, sitting in folding chairs, playing board games, having a picnic. How have people activated this open space?	*Everyone at my intersection was just passing through. No one stopped along the way to sit or played anything along the way.*
Are there pets in the streets? On leash?	*There were two dogs on a leash with the group of female walkers.*
Is there any non-permanent signage? Whether for the Open Streets event or to entice people into stores?	*Two of the clothing boutiques along the street had chalkboard signs encouraging people to "come in and browse."*
Does there appear to be a pattern of movement? E.g., most people are walking/biking toward baseball game, park, certain store.	*Most people seem to be heading toward the shopping/restaurant district two blocks away.*
Is there security? Police (walking or biking), volunteers?	*There was 1 police officer on a bike and 2 Open Streets volunteers.*
Additional notes?	*The streets were in pretty rough shape which made it hard for people to use the entire space. They mostly stuck to the right side.*

Repeat this same table for Observation Time #2 & #3 and for Observer #2's Observation Times #1, #2, & #3.

Activity Level (During Open Streets Event)

What does it measure?
Measures of activity level are used to determine how participants spend their time at Open Streets and how much physical activity participants are receiving (compared to CDC guidelines of 150 minutes per week for adults and 60 minutes per day for children.).

Why measure it?
A short intercept survey is one of the methods used to assess participant activity level during the Open Streets initiative. Additionally, an interactive poster and Participant Count can be used to allow for a larger sample of participants to quickly inform evaluators on how the community is spending their time at Open Streets.

How do I measure it?

Supplies needed:
- ☑ Participant Survey Tool (located on pgs. 33-34 of this toolkit)
- ☑ Poster of activity wheel
- ☑ Small stickers
- ☑ Poster stand
- ☑ Consent form (if survey results are being used for academic & dissemination purposes)
- ☑ Response rate form
- ☑ Clipboards
- ☑ Pencils
- ☑ Spreadsheet

Note: *The activity wheel and the communication methods (how the participant learned of the Open Streets) posters are captured in the same document/poster.*

Poster Steps on the Pathway to Measurement:

Step 1: Create an activity wheel poster. A template is available online on this website. The activity wheel (pie chart) addresses five primary forms of physical activity at Open Streets: walking, jogging, cycling, using another wheeled device (skateboard, wheelchair), and participating in Activity Hubs.

Step 2: Print and mount final poster. Print the activity wheel poster. A poster size of 4' wide x 3' high is recommended. Mount each of the posters on a thick and sturdy poster board.

Step 3: Collect poster data on Open Streets day. Set up the poster at a hub centrally located within the route. One to two staff members or volunteers (depending on expected attendance and capacity of staff/volunteers) will approach as many event participants (bicyclists, walkers, joggers, etc.) as possible that pass the posters. Each participant will be instructed to use a sticker to indicate their primary activity during the event. Staff/volunteers can place the sticker for cyclists so they do not have to stop and dismount.

Step 4: Putting it all together. Count the number of stickers in each activity on the wheel. These counts can be compared to previous events and be used to inform future activity priorities.

Participant Survey Steps on the Pathway to Measurement:

Step 1: Select questions desired for the survey. It is best to limit the survey to one page to make it quick and improve response rate (the number saying yes!).

Step 2: Print a sufficient number of copies of the Participant Survey. Print out copies of the Participant Survey tool depending on the number of surveys the organizers hope to collect or the estimated number of event participants.

Step 3: Select survey location sites. Select distinct route segments where the surveyors will collect data. It is necessary to cover the majority of the route with these survey locations. Two surveyors will be assigned to each survey location/segment.

Step 4: Collect participant surveys. Be sure to fill in the time and date of each survey. As surveyors walk along their assigned segment, the goal is for each surveyor is to obtain 20 completed surveys during each 2 hour period. The specific protocol for the surveyors is located on the first page of the survey tool (shown on p. 32 of this toolkit).

Question 6 (located on pgs. 33-34 of this toolkit) provides information on the activity level of participants and how people spend their time in the Open Streets (and how much time they spend doing those specific activities).

Step 5: Putting it all together. Input the survey responses into a spreadsheet.

PATHWAY TO MEASUREMENT FOR OPEN STREETS PARTICIPANT SURVEY

The purpose of this survey is to understand who is attending Open Streets Initiatives and how they are participating. The survey will take participants about 5 minutes to complete and consists of 32 questions on Open Streets, perceptions of the city, and basic demographics. No names or identifiers are collected with the survey. Two people will be stationed at each of the three survey locations:

Location #1: *11th & Pine, outside Starbucks*

Surveyors: *Becky Warren & Shirlie Thomas*

Survey Sheets: #1 - 30

Location #2: *8th & Chestnut*

Surveyors: *Stan Alvarez & Cindy Duncan*

Survey Sheets: #31– 60

Location #3: *10th & Walnut*

Surveyors: *Christy Schmitz & Tim Collison*

Survey Sheets: # 61- 90

Participant Survey

The protocol is as follows:

- Surveying will take place between [Give time period and date]. The goal is for each surveyor to obtain 20 completed surveys during the 2 hour period. Each survey will take approximately 5 minutes to complete. If you finish early, you can record observations at your survey point or explore the rest of the route and summarize your experience. Qualitative sheets will be provided as well.
- All participants must be at least 18 years of age. Please ask if you are unsure if they are at least 18 years of age (for academic research and consent only).
- Introduce yourself (name and affiliation). State that you are evaluating Open Streets and that these results will be shared with the city.
- Indicate that you are not asking for any identifying information.
- You can give participants the option to be asked the questions (interview) or fill out the survey themselves (self-administered). Clipboards are provided.
- Offer the project information sheet/consent to them prior to filling it out (they do not have to take these; it is for their information. Again, this is only for academic publishing purposes).
- To the best extent possible, please approach each person that passes your designated area, not avoiding any persons or only approaching your same gender., age group, or race/ethnicity.
- If you approach a group of people, only one person should fill out the survey. Please ask the person with the birthdate closest to today to complete the survey.
- Be sure to thank them for their time even if they refuse.
- Please keep a tally sheet of people approached and people participating (response rate).

Open Streets Response Rate Form

OPEN STREETS RESPONSE RATE FORM

Event: *St. Louis Open Streets*

Date: *11/23/13*

RESPONSE	CYCLIST		WALKER		OTHER	
	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE
YES	6	5	10	3	2	5
NO	3			5		

Participant Survey

PARTICIPANT SURVEY TALLY SHEET

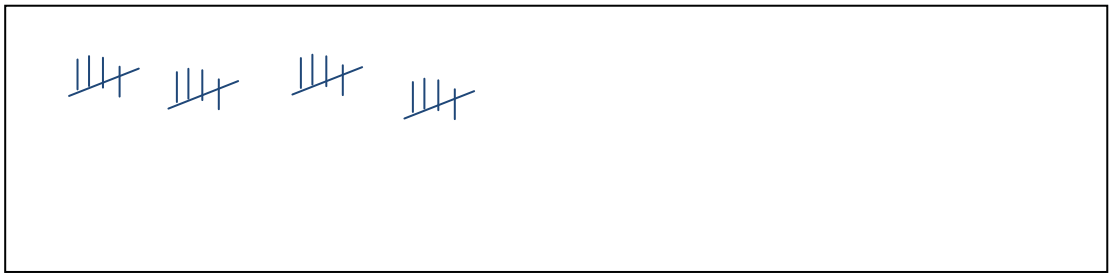
OPEN STREETS

Researcher/Surveyor Name: Becky Warren

Location: 11th & Pine, outside Starbucks

Persons approached and asked to participate:

Persons accepting (should equal 20):



ID numbers of surveys and time surveys completed: ID #s: 1-20

Additional Notes (numbers, activities, differences from the first Open Streets, weather etc.):

The weather was really cool during this time, so it was hard to get participants to stop and take our survey. We also were in a place that had a biking activity hub, so people did not stop very frequently.

Participant Survey

The example survey featured on pgs. 33-34 is a two-page version of a survey conducted during a St. Louis Open Streets event. Other templates for a shorter, one-page survey and a longer three-page survey are available online on this website. Choose which survey template best fits your evaluation needs.

How do I Choose Which Questions to Ask?

When designing your survey or modifying an existing template, it is important to choose questions that ask participants for information that is important for *your* specific Open Streets. Questions that provide information that key stakeholders, Open Streets partners, and future planners can use is key.

Topic Area	Example Questions	Why Ask These Questions?
Demographics	- What is your home Zip Code? - What is your age? - Which one or more of the following races/ethnicities best describes you? - What is the highest level of education you have received?	These questions are asked in order to get a better idea of who is participating in Open Streets. This information can be used to characterize your population for publications or can be used to tailor advertisements or message targeting for future Open Streets events.
Time Spent & Activities at Open Streets	- How long do you plan to spend at Open Streets? - How much time have you spent or do you plan to spend doing the following activities? - How much money have you/ your family spent or plan o spending today at Open Streets? - What is the main reason you came to Open Streets today?	These questions are asked in order to get a better understanding of what people are doing at Open Streets. This information can be used to encourage business community buy-in, plan future Activity Hubs, and discover what about Open Streets worked and what needs to be redesigned. These questions also answer how much physical activity participants are getting.
Feedback on Open Streets	- What is your main recommendation for improving everyone's experience at Open Streets? - If you could suggest a new route for Open Streets, what would it be?	This information can be used to improve future Open Streets events. It can also be used to highlight your successes and incorporate other parts of the city in the future.

Participant Survey

ST. LOUIS OPEN STREETS | PARTICIPANT SURVEY | JUNE 30 2012 TIME ADMINISTERED: 2:45 pm

1 What is the main reason you came to Open Streets today?

To have a place for my kids to play.

2 Have you attended Open Streets events in the past?
1 Yes
(0) No

3 How did you hear about this event?

I saw a flyer at my community center.

4 What would you be doing if you were not here?
1 At home indoors (e.g. T.V., on computer, reading, etc.)
(2) Other recreational activities (indoors)
3 Other recreational activities (outdoors)
4 Other (specify) _____

5 How long do you plan to spend at Open Streets? 3 hours

6 How much time have you spent or do you plan to spend doing the following activities at Open Streets?

		Hours or Minutes			Hours or Minutes
1	Walking:		4	Other wheeled device:	
2	Bicycling:	2 hours	5	Running:	
3	Activity Station:	1 hour	6	Other:	

7 Not including today's activities, on how many of the last 7 days did you walk or do other moderate/vigorous physical activities (i.e., brisk walking, gardening, or anything that increases your breathing or heart rate)? 3 days

8 On average, how much time per day did you spend doing moderate/vigorous physical activity, during the past 7 days? 30 mins.

9 How did you get to today's event?
(1) Automobile
2 Metro/bus
3 Bicycle
4 Walk/run
5 Other (specify): _____

10 Does St. Louis Open Streets change your feelings about the city?
(1) Yes, positively.
2 Yes, negatively.
3 No change.

11 How much money have you/your family spent or plan on spending today at Open Streets?
0 Nothing.
(1) Less than $10.
2 More than $10.

12 Where do you plan on spending or where have you spent your money?
1 At a restaurant along the route.
2 At a store along the route.
(3) At a vendor station.
4 Public transportation/parking
5 Other (specify): _____

13 Did visiting Open Streets make you aware of a store or restaurant that you did not know existed prior to today?
0 No
(1) Yes. (specify): The Bluebird Café which is a cute coffee shop on the corner of 15th & Elm.

Participant Survey

ST. LOUIS OPEN STREETS | PARTICIPANT SURVEY |JUNE 30 2012

14 What is your main recommendation for improving everyone's experience at St. Louis Open Streets?

Provide a map and information sheet about each of the activity stops along the way.

15 If you could suggest a new route for St. Louis Open Streets, what would it be?

One that winds through Soulard or Lafayette Square. Those areas are so historic.

		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
16	Open Streets is a free event that welcomes everyone.	(5)	4	3	2	1
17	Open Streets strengthens our community.	(5)	4	3	2	1
18	People at Open Streets generally get along with each other.	5	(4)	3	2	1
19	I feel safe at Open Streets.	(5)	4	3	2	1
20	Outside of Open Streets events, St. Louis provides friendly environments to walk.	5	4	3	(2)	1
21	Open Streets provides an opportunity to reduce my stress.	5	(4)	3	2	1

22 At Open Streets, I encountered people from other racial/ethnic backgrounds, economic status, and/or education levels than my own.
(1) Yes
0 No

23 What is your home zipcode? | 6 | 3 | 1 | 1 | 4 |

24 Do you have any of the following in your neighborhood?

(1) Small park
2 Large Park
3 Playground
4 Basketball Court
5 Swimming pool
6 Other: _____

25 How far do you have to travel to get to a recreational space (park, playground, etc.)? Miles: *½ mile*

26 Including yourself, how many people live your household? *5*

27 How many are under the age of 18? *3*

28 What is your sex? 0 Male (1) Female 2 Other

29 What is your age? *34*

30 Which one or more of the following describes you?

1 White
(2) Black or African American
3 American Indian or Alaska Native
4 Pacific Islander
5 Asian
6 Hispanic/Latino
7 Other (specify):_____
8 Decline to state

31 What is the highest level of education you have received?

1 Less than high school diploma.
2 High school diploma or GED
3 Some college or associate's degree
(4) College graduate.

32 Is your combined household income less than $45,000/year? 1 Yes (0) No

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